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Original Articles.

POLIOMYELITIS.*

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The recent epidemics of poliomyelitis in Nebraska and elsewhere have compelled us to admit great inaccuracy in our text book descriptions of that dreaded disease. In the light of modern experience, the name Infantile Paralysis is a misnomer. Poliomyelitis appears most commonly after infancy during childhood, just as do the acute exanthematous diseases. The laity speak of it as a new disease, which opinion—unfortunately for us—is corroborated by a few uninformed, or at least unwise, members of our profession. Our want of exact knowledge concerning the organism of poliomyelitis, its origin, conditions for growth and mode of transmission, warrants conservative conclusions, but does not excuse culpable ignorance. Clinical observation by educated men in general practice, supplemented by the field work of experts in climatic and sanitary conditions, plus the results by bacteriology and microscopy in our laboratories, are rapidly clarifying our knowledge of this disease. Whatever the virus may be, its infectious properties are certainly well proven.

It is a satisfaction to know that American physicians have the credit for the most recently established facts regarding poliomyelitis. The portals of entry through which the organism reaches the circulation are most probably the naso-pharynx and mouth. That suggests a basis for the use of preventive measures, when for any reason infection is suspected. Prior to 1907 the most clearly defined focus of the disease was in Scandinavia, and the first geographical points affected by poliomyelitis in the United States, were localities where large settlements of Scandinavians had congregated. This is only suggestive evidence in tracing the organism and its vehicle for transportation to widely separated points. I am not advised as to the dominant nationality of our recently infected districts in Nebraska.

*Read at Gage County Medical Society meeting, April 16, 1912.

Types of the Disease.

We meet several types of the disease, all having some symptoms in common, but each type presenting signs peculiar to the function of the tissues involved. The most common, and among all the most familiar to every one, is that designated the spinal type. One of its striking features is the peculiar grouping and distribution of the paralyzed muscles, without reference to their physiologic functions. This is true because the nerve supply of a given part of an extremity does not all arise at the same level in the cord. The anatomical arrangement of the vessels supplying blood into the cord are given off at right angles to the supply artery, are horizontal—not vertical—and terminal.

In connection with this fact we should remember that the blood may have the same potential of virus through the whole course of the circulation, but where there is a greater relative number of terminal arteries the toxic agent becomes effective at that point. This aggregation of blood supply is true in the cervical and lumbar regions of the cord, which parts originate the maximum nerve supply to the extremities.

In poliomyelitis the extensors more than the flexors are impaired. That fact fortifies the theory of a blood borne virus since the blood supply is greater to the anterior than the posterior part of the cord. The hyperesthesia, nervous irritability and sweating are vasomotor expressions in sympathy with the spinal nerve cells impaired or destroyed, in the anterior horns of the cord. The pyrexia and pain often concurrent with the foregoing symptoms are common to other diseases, and do not furnish the necessary evidence for a diagnosis. If to the foregoing we add the presence of paresis or paralysis in single muscles or groups of muscles, the evidence of spinal poliomyelitis becomes conclusive.

The lumbar and cervical enlargements are the more vulnerable points of attack in the cord, but the personal experience of men in this audience will verify the writer's experience that in some cases quadruplegia is supplemented by paralysis of the erector spinae and abdominal muscles. This fact is paralleled—but not explained—by other types of myelitis.

The type above all others, that gives rise to divergent views with occasional unpleasant disputation between physicians, is denominated the cerebral type. In it the brain, medulla and pons are the parts receiving the brunt of the attack, leaving the cord unaffected or but slightly damaged. This fact, too, is paralleled by the preference of lead for the musculo-spiral with consequent wrist drop, while alcohol prefers the extensors of the feet, and causes foot drop. The clinical similiarity of this type with meningitis of the diplococcus intracellu-

laris form, is so marked that unusual clinical observation is essential to a differential diagnosis. Even then a lumbar puncture supplemented by an intelligent microscopic examination is necessary to a certified diagnosis of either disease. In both maladies there is an absence of marked prodromal symptoms, a rapid onset, headache, prostration, delirium, extreme hyperesthesia, pain in the nape of the neck, rigidity, and Kernig's sign may be present. Under these conditions if cranial nerve paresis or palsies of single muscles are present, the evidence justifies a diagnosis of poliomyelitis. The nerves of the eyes, throat, or respiration will suffer if the virus attacks the nuclear centres in the brain where the nerves for these parts arise.

There can be no doubt of meningeal involvement in the cerebral type of poliomyelitis; that is the spent force of an attack on the cells external to the mebranes of the brain and cord. The clinical picture evolved by an irritation of the meninges of the brain, is a composit of mental and cerebral evidence not peculiar to symptoms originating in the cord membranes.

A third type is designated the polyneuritic. As the name indicates, *many* nerves are involved. The pain is severe and general, the fever high, and we are apt to suspect neuritis or rheumatism. We should remember that multiple neuritis is uncommon in children, and that its most common cause is alcoholism. Rheumatism is common in children, but the salient points differentiating rheumatism or peripheral neuritis from poliomyelitis are well known to every physician. The fact that pain exists causes the patient to hold the limbs quiet, even rigid, thus the presence of weakness in the muscles may not obtain early recognition. Rigidity and resistance are possible only when partial paralysis exists. It is a combination simulating spasticity and may lead to an error in diagnosis, during the acute stage of the disease.

A fourth type infrequent but not unknown is the ascending type. The palsy begins in the legs and by gradual extension involves all the muscles including the spincters of the bladder and bowels. The sensory nerves too, are paralyzed. The progress is rapid till the external muscles for respiration are involved, and death closes the scene. The identity of this with what our text books designate Landry's Paralysis, is quite suggestive. I have personally attended two such cases, and by courtesy observed a third one, each of which were fatal. All three were certified as Landry's Paralysis.

Treatment.

The results obtained by giving urotropin during the acute stage justifies its use. It produces formaldehyd in the blood, secretions, and spinal fluid. It is supposed that the antiseptic properties of formaldehyd destroy or at least reduce the potency of the infection. On the advisability of giving formaldehyd direct, I am not informed, but see no objection and probable benefit by its use as a spray to the mucous membranes, or by inhalation. The administration of anodynes for relief of pain are sometimes necessary. The relief of acute symptoms

is greatly facilitated by warm baths, hot packs, and copious *hot* drinks of water, orange or lemonade. The alimentary canal should be rendered aseptic and maintained free from abnormal fermentation. The treatment for relief of acute symptoms does not end our obligations to these patients. Our management succeeding the acute symptoms needs wise, faithful, and persistent guidance. If it was essential for comfort that the patient be quiet during the acute stage, it is not less imperative that rest be continued during the convalescent period, to prevent overstretching of weakened or paralyzed muscles. The daily contraction of an opposing muscle as a means of stimulating its weakened antagonist, is apt to exhaust the slight daily progress in the partially or wholly paralyzed muscle. For that reason the weakened muscles should be supported by sand bags or any suitable mechanical contrivance that will hold them in a normal position. If they are tender, heat either moist or dry, will tend to give relief. The disappearance of fever, the absence of pain and restoration to the normal desire for food may be followed by a period of marked tenderness on pressure, of the affected muscles.

The convalescent period begins when that has subsided, and then we should begin the regular every day or second or third day treatment by massage, the vibrator, and electrical stimulation, all to be continued through many months of persistent efforts to encourage growth in weakened motor nerves. Gentle massage in the direction of the blood current in the veins will increase the nutrition. Immediately subsequent to a warm bath the use of the vibrator, or the Faradic current of sufficient strength to cause gentle contraction in the affected muscles, will benefit the patient. The advantages of this line of treatment are not obvious from day to day, but in the course of months, will show marked benefit. It is difficult for men doing a busy rural practice to keep these cases under treatment, but human nature during illness as in health, demands attention, and if the family doctor will not take time to treat them, they early submit their case to a "rubber doctor" to whose support they cheerfully contribute.

Conclusions.

1. Meningeal involvment is undoubtedly present in poliomyelitis, under conditions of extreme virulence of the infecting organism, or with a moderate potency of the poison, and weak resisting powers by the individual.

2. The clinical symptoms of meningeal implication are for obvious reasons, most marked in the cerebral type of the disease.

3. The fatalities are due to paralysis of the muscles of respiration causing breath hunger to the starvation point.

4. Proper treatment prolonged one to two years subsequent to the convalescent stage, is often attended by marked improvement in muscle power.

5. It is an infectious disease and should be so reported and treated.

6. Ten days is the average incubation period.

THE STUDY OF MALIGNANT TUMORS.

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The study of malignant tumors by experimental methods has not given us a cure nor anything definite concerning their etiology, but it has taught us many interesting facts concerning their growth.

It is evident that many more cases of carcinoma are now being diagnosed by surgeons and general practitioners. That this is due to an actual increase in the number of cases, I think is yet unproved. Possibly this increase is due to two factors; First, to improved diagnosis, and Second, increase in length of life as a result of lessened mortality among infants.

Reichelmar has shown that in Berlin 20 per cent of those dead from cancer come to autopsy without a diagnosis having been made. Perhaps the same may apply in this country.

As regards the frequency of cancer, the analysis given by Bashford of the causes of death in England and Wales during the year 1905 are of interest. During that year there were 137,128 deaths in males over the age of 35 years. Of these 11,908 were due to cancer. In the same year there were 138,477 deaths among females more than 35 years of age, of whom 16,875 died of cancer. Therefore, of persons dying over the age of 35, one out of every 11 men died of cancer, and one out of every 8 women.

For several centuries medical literature has contained reports of the contagiousness of cancer. It has been asserted that the disease occurs in epidemics; that it is increasing in frequency; that in some localities it bears a significant relation to the soil and water; that human tumors may be inoculated into lower animals; and many claim to have discovered a specific parasite as the causative agent.

In 1773 a prize was awarded Bernard Peyrilhe by the Academy of Sciences, Belles Lettres and Arts, at Lyons, for the best dissertation on the subject of cancer. Peyrilhe found that by subcutaneous injection of what he regarded as "cancerous virus" he could reproduce those clinical features, which at that time were supposed to be characteristic of the disease. We now know that the conditions shown by him were due to the transference of pathogenic bacteria and not to a "cancerous virus". Laigenbeck in 1840, and Villemin in 1865 attempted animal inoculations with human cancer and obtained what they believed to be successful results, which are now attributed to the transference of tuberculous and not of cancerous tissue.

It was not until Thiersch, Waldeyer and others established the relation of cancer to normal tissue and the possibility of its origin from

these tissues that the study of this condition was placed on a sound basis. Their investigations indicate, first, that the malignant growths destroy life through their power of progressive poliferation and dissemination in the body, with the accompanying secondary infections, which so frequently occur; and second, that the growth develops from a sharply circumscribed area.

Numerous hypotheses have been advanced to explain the origin of cancer, some of which will be briefly referred to. They might be divided roughly into those dealing with the parasitic theory and those dealing with cell autonomy.

Gohnheim in 1874 advanced the view that tumors originated from embryonic rests. These remains of embryonic tissue were assumed to take on ultimately the power of further proliferation, owing to the action of various agencies.

Rous studied the relations existing between embryonic tissue and tumor tissue when a mixture of the two is injected into susceptible animals. Under these conditions the embryonic tissue grew no more actively than when injected alone and eventually was absorbed as it is in animals when injected without the tumor material. He occasionally found a direct union between the tumor tissue and some of the stratified epithelial tissue of the embryo.

In studying the ovaries of guinea pigs at various stages of the sexual cycle, Loeb observed structures which appear to be parthenogenetically developing ova. In some cases, chorionic vesicles and syncytial cells were noted and a structure which he interpreted as a neural tube. Such developing ova he found in about 10 per cent of young guinea pigs' ovaries. In view of these findings, teratoma and chorioepithelioma may arise from parthenogenetically developing ova and not from misplaced blastomeres. He thinks that altered conditions in the ovary, variations in blood pressure, and a change in the oxygen supply, may account for the parthenogenic development of these ova.

Hanseman ascribed the unlimited growth of the epithelial cells to atypical mitoses and believes the cells to be without power of differentiation. He refers to this condition as anaplasia.

Ribbert thinks that dislocation of epithelium from its normal association with surrounding epithelium and connective tissue brings forth latent power of unlimited proliferation, this excessive proliferation being due to the removal of the cells from the influence of tissue tension by which their growth is normally restrained, maintaining that the cellular changes in the supporting connective tissue are sufficient to incite a cancerous growth. He believes the most favorable condition for the development of tumors to be an inflammatory growth of connective tissue which separates the epithelial cells, these being free from

tension, develop into tumors. This change in the connective tissue he terms the pre-cancerous stage. He made many attempts to produce tumors by separating adult cells from their connections, but without success.

Thiersch was of the opinion that an equilibrium exists between epithelium and connective tissue, but owing to the fact that the connective tissue ages more rapidly, the restraint exercised by it is lost, in which case there is an unlimited growth of epithelium. He found in the weakening membrana propria and strona of the atrophying breast a relief of tension capable of reawakening the formative tendencies of the gland cells, thus causing the cancer. He regards the growth of cells as degenerative proliferation.

In relation to these views, particularly the two latter, it might not be amiss here to call attention to the so-called heterotrophic proliferation in chronic inflammatory processes. This condition has often been diagnosed as beginning carcinoma by those who have not taken into consideration the fact that chronic inflammatory changes involving epithelial cells, sometimes cause them to present an altered appearance and to lose their normal relations to the basement membrane.

Various types of bacteria, coccidia, sporozoa, blastomycetes, spirochetae, etc., have been advanced as the causative agents, but no one has been able to offer substantial proof that any one of these bore more than a casual relation to the tumor in which it was found. The numerous cell inclusions, thought by some to prove its parasitic nature, are now believed by most workers to be a feature of cell degeneration.

In 1907 Gaylord observed spirochaetae in several primary tumors of mice. This he considered significant for they were present not only in the primary tumors, but also in increased number in the more malignant tumors of subsequent generations. Tyzzer soon showed that spirochaetae were frequently found in other conditions in mice, particularly in inflammatory conditions of the skin, and Gaylord later reported a means of freeing the tumors of spirochaetae without injuring the tumor growth.

Blastomycetes have been advanced, particularly by Sanfelice, as the causative agent, but no proof has been offered to show that it is caused by any member of this family of organisms. Sanfelice supposes that the cellular inclusions represent dead saccharomyces neoformans, but similar cell inclusions are found in other conditions and at present are not considered to have any significance as etiologic factors.

The results obtained by Rous at the Rockefeller Institute are more suggestive than any previously described, as they indicate that the malignant growths may be due to the action of a live virus.

In 1909 he reported the successful results obtained in the inoculation of chickens with fragments of a sarcoma developing in the breast of a Plymouth Rock hen. This tumor appeared to be a typical spindle cell sarcoma.

Following the demonstration that the tumor was transferable to other chickens he then made filtration experiments. The tumor was ground in a warm, sterile mortar, with warm sand mixed with warm Ringer's solution, shaken for 30 minutes in a room in which the temperature was kept at 38' C, then centrifugalized and filtered through a Berkfeld filter which held back the bacillus prodigisus. The filtration was done at a temperature of 38.5' C, and injections made immediately. several chickens inoculated by this method developed tumors identical with those of the parent growth.

I am indebted to Dr. Rous for the following unpublished information:

The extrinsic agent is rapidly killed by autolysis, by 50 per cent alcohol and by 0.5 per cent carbolic acid, but i tis resistant to the action of glycerine for many days, and in the tumor tissue will withstand freezing and rapid thawing, which reduces the tissue itself to a pulp. It is destroyed by a temperature above 53' C. for 15 minutes, but will sometimes survive 53' C. for that period. On the other hand, the tumor cells are killed by a temperature of 47' C. In the dry state the virus keeps its activity for months.

It has been shown distinctly that metastases of the growth are produced by the survival and growth of cell emboli. A suspension of tumor cells was injected in a wing vein, and some days later the fowl was killed and the lung sectioned. Emboli were found in the pulmonary vessels.

Apparently the virus requires for its action a preceeding cell derangement. When injected the tumor appears only at the point injured by the needle, except when irritative bodies have been injected with it. in the latter case the growth appears as a diffuse mass in the muscle substance.

It will survive at least 12 days in a celloidin capsule in the chicken's abdominal cavity. But all painstaking attempts to grow it, or even to make it survive on special media, have been failures.

So far Rous has been unable to obtain similar results with the tumors of rats and mice, making it difficult to arrive at a satisfactory interpretation of his results. The morphology of the growth appears to be identical with that of the ordinary spindle cell sarcomata and yet why should not similar results be obtained with the spindle cell sarcomata of rats and mice? It is possible that the part of his technique involving the keeping of the material before inoculation at the

constant temperature of 38° C. is the important factor. I can do no better than quote Rous on this point.

"The first tendency will be to regard the self-perpetuating agent acting in this sarcoma of the fowl as a minute parasitic organism. Analogy with several infectious diseases of man and the lower animals caused by ultra-microscopic organisms gives support to this view of the findings, and at present work is being directed to its experimental verification. But an agency of another sort is not out of the question. It is conceivable that a chemical stimulant, elaborated by the neoplastic cells, might cause a tumor in another host and bring about in consequence a further production of the same stimulant. For the moment we have not adopted either hypothesis."

While working at the Rockefeller Institute, the writer attempted filtration experiments with a number of different tumors developing in rats and mice, and similar attempts had been made by other investigators, but in no instance did tumors develop following the injection of filtrates.

Many attempts have been made to produce atypical growths, and probably the most successful were those made by Fischer in 1906. Ribbert had previously pointed out that in carcinomatous growths of the skin there is frequently an inflammatory infiltration of the sub-epithelial connective tissue. Fischer therefore planned to bring about the proper physico-chemical environment by producing a chronic inflamation which involved the epithelial layers of the skin. His first experiments were with bits of sterile muscle, liver, spleen and agar. In one instance the epithelium did proliferate and grow down around the agar masses, but in further experiments he failed to obtain similar results. He then used olive oil, because of its slow absorption and the slight chronic inflammation which it produces. The pure oil did cause, after several weeks, a thickening of the epithelium, but no atypical growth. Various substances were added—using the oil as a vehicle—without obtaining the desired result until the fat staining dyes, Sharlach R., Sudan III, and Indo-phenol were used.

According to Fischer, when a saturated solution of Scharlach R. in pure olive oil is injected beneath the epithelium a marked change follows. The tissues show all the changes of sub-acute inflammation with the formation of giant cells. In a few days typical and atypical mitoses are found in the cells of the gland ducts, in the hair follicles, and in the superficial epithelium. Further, processes of epithelium grow down into the adjacent tissues toward the oil droplets, and in many instances surround them. Fischer says the picture so produced cannot be distinguished from squamous carcinoma in man. He reports

that in one instance he found an epithelial plug growing in a lymph channel.

This work has been repeated by a number of workers with varying results, but the consensus of opinion is that these fat stains do exert a stimulating effect on the growth of the epithelium, a growth which is limited in character, and which disappears with the removal of the stimulating substance.

Another very important contribution to this subject is that by L. Loeb. This investigator discovered that the whole uterine mucosae was transformed into a maternal placenta, following the introduction of foreign bodies into the uterine cavity of a guinea pig approximately six days after ovulation. After five or six days an extraordinary increase in the size of the uterus takes place. This is followed by a period during which the pressure upon the newly formed placental tissue enclosed within the uterine muscle wall becomes so great that autolysis sets in and in a few days most of the placental tissue is changed into a brownish fluid. In these experiments the Fallopian tubes were previously ligatured to prevent the entrance of the ovum. The introduction of small particles of parafin, of a very thin glass rod, or of a thin platinum wire was sufficient for the purpose.

He also found that if incisions were made in the two horns of the uterus six or seven days after copulation, the tubes having previously been ligated to prevent the entrance of the ovum, deciduomata developed at the site of the injury. These growths are distinctly visible, but also retrogress and disappear. According to Loeb, the maternal placenta and growths just described are due entirely to some substance furnished by the corpusluteum and not to any specific action exerted by the ovum.

So far as the writer is aware, no growth having the characteristics of a malignant tumor has been originated by man experimentally, unless X-Ray carcinoma be so regarded.

Practically all the so-called epidemics have been noted among animals and fish. Epidemics among animals have been reported by Loeb, Borrel and Gaylord; among fish by Plehne, Pick, and more recently by Gaylord. A careful examination of these reports shows that cancer does occur with great frequency among aged animals, but rarely among the young. It is remarkable that young animals should escape infection under such conditions as they are more susceptible to successful inoculation with malignant tumors than old ones. Bashford found no such epidemics in his experiments with 30,000 mice, housed under the most favorable conditions.

The fact that cancer rarely occurs in the young does not necessarily prove that it is not due to a live organism. Many of the in-

fectious diseases such as infantile paralysis and exanthemeta, etc., are more prevalent at certain ages.

Tyzzer's experiments show the great importance age bears in the development of primary tumors in mice. His experiments were conducted to determine the affect of heredity on mice born of parents having tumors and of those born of healthy parents. Briefly, he found that tumors developed in both series, but that they were much more frequent among mice with tumor ancestors. His results show that the influence of age has the same significance in animals as in human beings. Among the animals dying during the first six months it was exceptional to find a tumor in either series, whereas, among those living from six months to a year tumors developed in 23 per cent of those springing from healthy ancestors, and 5 per cent of those from tumor ancestors. Among those living two years there were 50 per cent in the first series and 77 per cent in the second. Tyzzer's reports are very interesting because of the bearing they have on these so-called epidemics.

The publications of Plehne, Pick and Gaylord, concerning epidemics among fish are much more significant than those I have just mentioned. This is particularly so of the instances related by Gaylord.

Pick states that cancer in artificially bred salmon trout carried off 7 per cent of the fish in one hatchery, while Bonnett reported as many as 3,000 cases in one hatchery within four months. In this case only those fish two years old and over were attacked, the young ones being practically immune. Several varieties of fish were kept in each tank, but usually only one variety in each suffered from the disease, though in neighboring tanks this same variety might escape and another be attacked. Pick concludes inbreeding, and the chemical composition of the water induces simple goitre, and this secondarily becomes cancerous.

Within the last couple of years Gaylord has also reported such an epidemic and in personal communications, several others. He states the disease attacked all the fish in the different tanks irrespective of age and variety. Marine and Lenhart have recently disputed Gaylord's conclusion. They state that the thyroid gland in the fish is scattered through the tissues of the neck and not encapsulated as in man, and what Gaylord interprets as invasion of the surrounding tissues, they believe to be hyperplasia of pre-existing thyroid tissue.

It has not been demonstrated that cancer is transferable from one human being to another, but that it can be inoculated into different parts of the same person is made evident daily from the presence of metastases. Alibert inoculated five human tumors on himself and his assistants with negative results. The successful transference of

malignant growths from one animal to another renders unnecessary similar experiments with human beings. In operations on malignant tumors surgeons have been exposed repeatedly to inoculation, yet the literature does not contain one instance on cancer developing following such exposure. This conforms with the results obtained in animal experimentation, as it is almost impossible to successfully inoculate an animal with the most virulent of tumors by this method.

Many attempts have been made to inoculate lower animals with malignant tumors from human subjects. Some experimenters report positive results, but I believe we are justified in being skeptical concerning the truth of their conclusions, though we cannot deny the possibility.

Metchnikoff and Grunbaum failed in several attempts to transfer human cancer to higher monkeys. In 1908 I inoculated some of the lower monkeys with material taken from an exceedingly malignant carcinomatous teratoma which was growing from the ovary of a young girl. This tumor grew with such great rapidity that it was thought to offer the most favorable type of growth for such an experiment. Microscopically the tissue consisted of hyaline cartilage, glandular columnar epithelium and a cellular stroma, with here and there a small clump of embryonic striated muscle cells. Mitotic figures were fairly numerous. The type of monkey used was the macacus Rhesus. The mass was cut up into small fragments, and eight of these used to inoculate each monkey. The fragments were so small that following the inoculation they could not be felt. On the 7th day, at the points of inoculation, there were distinct swellings measuring 2-3 mm. in diameter. From this date on, fragments were excised at different intervals, some being used for microscopic study, others for inoculation. By the 22d day the swelling which had been present in those not operated upon had entirely disappeared.

The fragments excised from the first monkey were used to inoculate two others. These also apparently increased in size, the maximum being about 4 mm., but at the end of 20 days they had completely disappeared. Microscopic examination of the fragments removed on the 11th day showed that all the epithelial cells had disappeared. The cartilage remained alive for at least 16 days, as evidenced by the pressure of mitoses.

The tumor in the patient grew with amazing rapidity after the operation. At each dressing of the wound a portion of the mass would adhere to the gauze and with this another transplantation experiment was made.

Histologically this piece contained no cartilage, but was composed

of masses of epithelial cells with a cellular stroma. Mitotic figures were very numerous.

This material was used to inoculate three new animals and to re-inoculate two old ones. The fragments in the new animals increased in size up to the 8th day, and then disappeared; those in the old annuls also increased in size up to the 8th day, and by the 16th could not be felt. Microscopic examination of those removed at different intervals showed that the increase in size, especially in those re-inoculated, was due almost wholly to inflammatory tissue and not to a growth of tumor cells.

Though a spontaneous tumor of the mouse can be sucessfully transplanted into other mice, it cannot be made to grow in a rat, or in any species other than the one in which it originally developed. Those tumors transplanted from one species into another show a temporary growth lasting from 6 to 12 days, but this is followed by complete absorption. If two such fragments obtained from a mouse tumor be implanted in a rat and one removed after several days and implanted in a mouse, the one left in the rat disappears completely about the 12th day. While the one transferred back to the mouse continues growing and assumes all the characteristics of the parent tumor. Ehrlich, who was the first to demonstrate this phenomenon, concluded that the mouse tumor contained a specific substance or "X-stoff" which enabled the tumor cells, for a time, to absorb nutriment from the rat, but as soon as this was consumed the tumor ceased to grow. When the same rat was used a second time for inoculation with mouse tumor, this temporary growth did not take place. According to Ehrlich's explanation this is either due to the fact that the first growth absorbed all the limited supply of suitable nutriment in the rat, or that it developed anti-bodies capable of destroying the mouse cells.

The location of the tumor varies in animals, but in the majority of instances it is in the region of the mammary glands. Apolant found that of his tumors, 25 per cent were situated on the side of the abdomen, 16 per cent in the region of the vulva, 15 per cent between the sternum and sub-maxillary glands. Tyzzer reports 20, of which 5 were in the subcutaneous tissues of the abdomen, 12 in the lungs, one was a lymphosarcoma of the thorax, and 2 were adenomata of the kidneys. Murray reports 142 tumors, the majority of which developed on the side of the thorax and in the inguinal region.

In our 41 tumors, 9 appeared in the lungs, 3 in the ovaries, 4 in the neck, 9 on the side of the thorax, 14 in the inguinal region and 2 in the region of the vulva.

The technique used in the inoculation of animals with tumor material is very simple, and may be done either with fragments or emul-

sions. The tumor used, whether primary or one which had developed as the result of inoculation, is removed with aseptic precautions and portions cut up into fragments a little larger than the head of a pin. The fragment is placed in the distal end of a large needle or cannula, introduced beneath the skin and with a trocar or large piece of platinum wire, pushed into the adjacent tissues By the other method, the tumor is ground into an emulsion in a sterile mortar, the stroma fished out and the emulsion injected into the sub-cutaneous tissues with an ordinary syringe.

Jensen was the first to investigate carefully the subsequent history of fragments introduced in this manner. He found first an accummulation of a serous exudate around the fragment, followed by a cellular reaction, the latter, as might be expected, depending upon asepsis and the amount of trauma. Probably the most valuable observation made by him was that the new growth developed entirely from the cells transplated. It is frequently difficult to differentiate between tumor cells and the young fibroblasts which are usually present in a slight degree as the result of trauma. Jensen's statements have been confirmed by practically everyone who has done experimental work with tumors and enables us to distinguish between the granulomata and malignant growths. With the former, of course, the growth arises from the tissues of the host as a result of the stimulating action of the virus on the cells.

It has also been found that when fragments are introduced, only the superficial cells bathed in the serous exudate survive and take part in the resulting growth. The cells of the remainder of the fragments degenerate and when examined later, the center of each is found to be composed of fibrous tissue.

The development of the stroma in tumors following inoculation has been the cause of considerable discussion. As has been stated, it is furnished by the host, and acting as a support for the nutrient vessels, its importance for the subsequent development of the fragment is evident. For these reasons the view has been advanced that the growth of the fragment or cell emulsion depends upon the surrounding cellular reaction, or, as it has been termed, "the specific stroma reaction."

Russel asserts that there is a marked difference in the cellular reactions surrounding fragments implanted in normal and in immune animals. According to him the changes during the first 2 days are the same' but after 5 or 6 days they vary greatly. In the normal animal there is an active cellular reaction and the development of many new blood vessels, these with their supporting connective tissue penetrating between the transplanted cells. On the other hand, in the immune animal there is a very slight cellular reaction and no development of

new capillaries, causing the transplant to die from lack of nutrition. This view has been combated by most workers and at present has few supporters.

The literature which has accumulated on the subject of successful transplantation of mouse tumors is voluminous, but there is relatively a small series of observations which enable us to determine the percentage of transplantable tumors. Ehrlich reports 230 tumors, of which 94 were inoculated into other mice, and 11 per cent of these proved to be transplantable. Tyzzer reports 4 carcinomata of mice, 2 of which were successfully transplanted, Bashford reports 17 out of 32, or 53 per cent as transplantable. Of our 41 tumors 25 were inoculated into other mice, and of these 20, or 77 per cent developed. From these tumors 1128 mice were inoculated, of which 855 survived more than two weeks. Of these, 104, or 12.1 per cent developed tumors. Of the 104 grafts which began to grow, 36, or 34 per cent, later underwent retrogression. The number of tumors developing in the first generations varied from 2 to 46 per cent and the period of incubation of the first tumors ranged from 30 to 180 days. Ehrlich inoculated 1504 mice with material from 94 primary tumors, of which 41, or 2.7 per cent developed tumors. Bashford transplanted 32 spontaneous tumors into 2278 mice with 3.2 per cent of successes.

In mice, tumors other than carcinomata are rare, in rats they are usually connective tissue in character, though Hanau worked with a epithelioma of the rat, and most of my work was done with a tumor which originally appeared to be an embryoma, but which after several generations acquired the characteristics of a simple alveolar carcinoma.

The majority of tumors in mice present the structure of an adenocarcinoma. When such tumors are successfully transplanted, the new ones, particularly when the growth is rapid, usually lose the glandaular structure and present the appearance of an alveolar carcinoma. Almost all the tumors which pass through many generations present this histologic appearance.

Ehrlich, Loeb and Bashford have each reported an instance in which a tumor originally showing only carcinomatous tissue became converted into a spindle cell sarcoma. In each instance the stroma during succeeding generations gradually became more cellular in character and eventually lost entirely the epithelial constituent, leaving a pure spindle cell sarcoma. The disappearance of the epithelial element was probably due to the more rapid growth of the sarcoma cells. Ehrlich had one tumor which presented both elements. He injected it into mice which had become immune following recovery from inoculable carcinomas, and found that the new growths were pure sar-

comata, the resistance of the mice preventing the growth of the epithelial cells, but allowing those of the sarcoma to develop.

Hanau, in his original article, reported the existence of metastases in the lymphatic glands in the neighborhood of the cancer of the rat.

Similar metastases, either appearing with the primary tumor, or as a result of the transplantations, have been described since by various authors. With few exceptions they have been confined to the lungs. Apolant reports that of 221 mice with spontaneous tumors, 2.2 per cent showed lung metastases; of Murray's 68 mice with spontaneous tumors, 27 had lung metastases, and 3 lymphatic gland metastases, and of our 26 mice, 5, or about 20 per cent had lung metastases.

There are a number of reports on record of complete spontaneous recovery in human beings from cancer. These relate more particularly to spontaneous disappearances of recurrences after operation, to disappearance of tumor tissue left after an incomplete operation, and to disappearance of metastases. Such cases have been reported by Czerny, Reichel, Rotter and others.

In practically every series of successfully inoculated animals, a certain percentage of the tumors undergo retrogression and are completely absorbed. As a rule the number of recoveries is proportionate to the virulence of the tumor. In this instance, by virulence, I mean the number of animals developing tumors. When we were obtaining only about 60 per cent of successes with our rat tumor we often had 50 per cent of retrogressions, but later when we were getting 90 to 100 per cent o fsuccessful inoculations we rarely had more than 10 per cent of retrogressions.

When tumors undergo retrogression certain histologic changes are usually apparent. Tumors which originally present the structure of an adenoma, but which, through successive transplantations, take on the structure of an alveolar carcinoma, not infrequently, assume the adenomatous type during retrogression. With this change in structure there is also a great increase in the supporting frame-work, and usually a fibrous capsule is present. The epithelial cells which formerly were large, irregular and with vesicular nuclei, now become smaller and have nuclei which are rather pyknotic. Foreign body giant cells may also be present at the margins of the necrotic material.

It has been shown repeatedly by Gaylord and Clowes, Jensen, Ehrlich, Bashford and others that when a tumor undergoes spontaneous retrogression, the animal bearing it presents a high degree of resistance to subsequent inoculations. The significance of the retrogression and of the disappearance of tumors is obscured by the fact that some tumors regress while others grow in the same animal, and some after regressing for a time, take on renewed growth. Loeb found

that if such a tumor were subdivided and replanted in the same animal it would often begin to grow rapidly.

To determine the length of time such a refractory state persists, we inoculated animals which had made spontaneous recoveries. They were subdivided; first, into those which had been free of a tumor at least thirty days; second, into those which had been free thirty to sixty days; third, sixty to ninety days; and fourth, ninety to one hundred and fifty days. Of the 61 rats inoculated, 10, or 16.5 per cent developed tumors as opposed to 86 per cent in the controls. The smallest percentage obtained was in the series inoculated during the thirty days after the complete disappearance of the first tumor.

These results, when taken in connection with those previously given are not in accord with the view that recoveries are due to the development of specific immune bodies.

Ehrlich by employing a hemorrhagic tumor which usually gave very small percentage of successes, many of which retrogressed, was able to produce an immunity against tumors of maximum virulence. By these means he produced resistance to subsequent inoculations with sarcoma and carcinoma and in a less degree against a chondroma. This reractory state he terms a pan-immunity against tumors.

Haaland, using Jensen's tumor, could not immunize Berlin mice against Ehrlich's sarcoma, and Michaelis could not immunize white mice by means of cancer from gray mice, nor Berlin mice by tumors from animals bred in Copenhagen. These results may be due to differences in technique, as Bashford found that if mice were inoculated with graduated amounts of a cell emulsion, those receiving large amounts developed fewer tumors than those receiving the small doses.

It is doubtful if there is a problem in biology concerning which so many conflicting results have been obtained, whether this is due to differences in technique, or to the animals used, has not been determined.

In addition to the methods just described, others have been used in the attempt to make animals immune to successful inoculation with malignant tumors. Michaelis, by the injection of normal mouse liver, Schone, with the liver of mouse embryos and normal mice; Borrel and Bridre with liver or spleen, and Bashford with the red blood cells of mice and the skin of mouse embryos, were able to create a certain amount of resistance to subsequent inoculations with malignant tumors. According to some pregnancy appears to retard the growth of mouse tumors and to render the animal less susceptible to inoculations. Both Bashford and Tyzzer report the development of spontaneous tumors in animals which were resistant to inoculation.

The results of attempted immunization against tumor inoculations

are hardly such that they can be explained by any known form of immunity. Following the discovery that many of the animals developing tumors subsequently made complete recoveries, it was thought that the serum might contain immune bodies capable of preventing the development of, or causing the disappearance of tumors in other animals. Gaylord and Clowes were probably the first to attempt this experiment, the results of which were highly encouraging, but not constant. Other workers, including ourselves, were not able to confirm these results. Jensen in his original work tried to produce a curative serum by injecting an emulsion of mouse cancer cells into rabbits, but failed to obtain results which could be considered of any value. Michaelis could not find in the serum of actively immunized mice evidences of cytolytic or agglutinating action on the tumor cells. Various workers have tried the complement fixation test, usually with negative results

The statement of Gaylord and Clowes that the blood serum of mice which have recovered spontaneously from implanted tumors exercises an immunizing or restraining effect on the development of implanted grafts of mouse tumors, led us to make similar experiments with our rat tumor. For this purpose serum was obtained, first from normal rats; second from rats which had failed to develop tumors following inoculation, and which were designated "negative"; third, from rats which had recovered spontaneously and designated "immune"; and fourth, from rats possessing growing tumors at the time the serum was collected, and designated "positive". Bouillon, Ringer's solution, normal Horse Serum, and heated and unheated emulsion of the tumor itself were used as controls. The procedures were varied in different experiments, so that the sera and other substances were given sometimes before and sometimes after the tumor implantations. The results showed that none of the sera, whether given before or after inoculation with the tumor, exerted any retarding influence on the growth of the implanted pieces. An interesting observation made during the course of these experiments was that a large percentage of the rats receiving the heated emulsion of the tumor itself, developed more tumors than did those receiving other substances.

Bashford observed that the injection of the blood of the mouse exercised a restraining influence on the development of mouse tumors. He found this property present in the corpuscles and not in the serum. We made similar experiments to determine if the same results could be obtained with our rat tumor. In performing this experiment whole rats, blood was used, washed rats' corpuscles, normal rat serum, and as controls, bouillon, Ringer's solution, heated and unheated tumor emulsion. Three series of animals were used. In the first, the different

substances were given the day preceeding inoculation, the second series 10 days before tumor inoculation, and the third 20 days before inoculation of tumor. In the first series comparatively little effect could be seen as the result of the action of these agents. In the second the effect was most marked among those receiving the washed corpuscles, only 40 per cent developed tumors, and all of these underwent retrogression and complete disappearance, while in the controls, 100 per cent developed tumors with no retrogressions. In the third series the effect was much less marked, the percentage of tumors developing being but slightly less than among the controls, and the percentage of retrogressions about the same.

It has been repeatedly observed by all who have studied transplantable tumors, that animals which resist implantation of tumor grafts are not wholly immune, and can often be successfully inoculated with a similar tumor of higher virulence. We were interested not only in confirming this result with the rat tumor, but also in ascertaining to what extent the effect of the first unsuccessful inoculation tended to add to the natural resistance of the animals. The first experiment was composed of animals divided into five series, first, those which had been unsuccessfully inoculated within 30 days of the second inoculation; and second, from 30 to 60 days previously; the third, 60 to 90 days; the fourth, 90 to 100 days; and the fifth, 120 to 150 days. The results showed that those receiving the first inoculation within 30 days of the second, had the greatest resistance, giving only 11.7 per cent of tumors, while the controls gave 86.2 per cent. The other series were rather uniform, giving about 53 per cent of tumors.

Another experiment was then conducted with those not developing tumors as a result of the second inoculation. These animals were also divided into two series; first, those receiving the second inoculation, no more than thirty days previously; and second, those receiving the second inoculation thirty to sixty days before. The two series gave 11 and 17 per cent of tumors respectively, while the controls gave 75 per cent.

It will be seen from the above results that failure to develop a tumor does not indicate that the animal is immune to subsequent inoculation. It is probably due partly to resistance on the part of the animal and partly to some condition present in the fragment transplanted. It is evident to all who have worked on the subject that the tumor itself plays an important part in these failures.

If a spontaneous tumor of a rat or mouse is implanted into 100 animals of the same species the first generation will rarely give more than 5 to 10 per cent of successes, but after several generations this same tumor may give 80 to 90 per cent of successful transplants. Bear-

ing this in mind, we would hardly be justified in concluding that the small number of "takes" in the first generation was due altogether to natural resistance.

Ehrlich found that in mice with rapidly growing tumors, secondary implantations usually fail to grow. His explanation is that certain special nutritive substances are necessary and that rapidly growing tumors use all of this, thus preventing the development of other implantations.

The fact that our rat tumor developed metastases so frequently seemed to contradict this latter view, we, therefore made experiments to determine the effect of secondary and tertiary inoculations. The tumors already present when the second inoculations were made varied in size from 0.7 to 2.5 C. M. in diameter, and had been growing from 30 to 150 days. The results obtained show conclusively that the presence of one tumor does not prevent the development of a secondary growth, but indicate that secondary implantations are likely to yield a smaller number of growing tumors. We then inoculated twenty-nine rats in which two tumors were already growing. Of these, twenty-three developed tumors as the result of the third inoculation.

An interesting experiment was performed by Rous to determine if the blood of animals resistant to several inoculations with a malignant rat tumor contained immune substances. Such rats were joined, after the manner described by Sauerbruck, with others which bore rapidly growing tumors. After such union, bacteria injected into the blood of one animal can be isolated from that of the other, while potassium iodide injected into one is excreted through the kidneys of both. Following the operations, growth of the tumors continued at the same rate as that noted in the controls.

The cells of a carcinoma are killed when kept at a temperature of 37 degrees C. for 24 hours. They are also killed by drying or by exposure at 45 degrees to 47 degrees C. Ehrlich found that tumor material could be kept frozen for months without destroying it, but we must not forget that Carrel has shown that this also holds true for normal blood vessels.

Loeb showed that heating a tumor to 44 degrees C. for some time before inoculation, retards the growth of the graft, lengthens the incubation period and increases the number of tumors which retrogress. The injurious action of the heat is not lasting in its effect, as further transplantation of these slow growing tumors usually restores their virulence.

Various authors have tried to determine the effect of the internal secretions of certain glands upon the growth of tumors. Greenbaum tested the influence of pituitary body, suprarenal glands, kidneys, tes-

tes, liver and parotid gland, and found all these organs to have a slight effect upon stimulating growth, the parotid appearing most active. They believe their experiments offer some slight evidence in favor of the hormone theory of the causation of new growths. In 1908 we tested various organ extracts but could not obtain a definite inhibiting or accelerating action with any one of them.

The results of most of the experimental work appear to confirm the view that cancer is not due to a parasite, but we must remember that the greater part of the work done relates to the study of tumors which are already established, and not to their etiology. Malignant growths, wherever found, are very similar histologically, and our inability to successfully transplant them from one species into another, also speaks against the parasitic theory.

Carcinoma is probably due to a lawless and unlimited growth of epithelial cells, and in order to arrive at a more correct idea concerning its nature, the differences existing between cancer cells, and those composing normal epithelium should be carefully examined. Fortunately we are now in a position to work in a more intelligent manner owing to our ability to successfully transplant tumors from one animal to another, and we are justified in expecting that much light will soon be thrown on this perplexing problem.

It is doubtful if there is anything present in youth inimical to the growth of cancer cells. The fact that cancer is rare in persons under 30 years of age probably means that age has something to do only with its origin, as animal experiments demonstrate that when once it has developed, its propagation is better assured by transplantation into young animals.

It would be difficult to explain the origin of mixed tumors and teratoma by the parasitic theory, particularly in the ctse of Lubarsch who found brain tissue and ependyma in the lung metastasis of an ovarian tumor. Congenital sarcoma of the kidney where the mother is free from a demonstrable tumor, would also be difficult to explain by this hypothesis.

An immense amount of experimental work has been done since Novinsky in 1870 demonstrated that cancer developing in one animal could be successfully transferred to another of the same species, a great deal of this work was done with the hope that a curative serum might be obtained. The methods used for this purpose were similar in many respects to those adopted in the production of other curative sera. Emulsions of cancer cells and tumors with a low grade of malignancy have been used for immunizing purposes, as no causative parasite has yet been discovered. The results of the immunity experiments may be stated as follows:

First, that a large number of animals make spontaneous recoveries, becoming immune to further inoculations with most malignant tumors of the same type.

Second, that inoculation with dead tumor material does not render an animal immune to subsequent inoculation with a malignant tumor.

Third, that inoculation of homologous or heterologous species with live or dead tumor material does not give a serum capable in any manner of influencing the growth of tumors.

Fourth, that a certain degree of resistance in animals to successful inoculations has been produced by various substances such as embryos of homologous species, epithelial cells, washed blood corpuscles, etc.

The treatment of malignant growths has been attempted by means of emulsions of cancer cells, but nothing more than temporary improvement has been obtained either in human beings or animals, usually none at all.

In 1909 Hodenpyl of New York, using a chyliform ascitic fluid obtained from a woman who had made a spontaneous recovery from cancer, obtained results which were considered suggestive as demonstrating the presence of immune bodies. The tumor was primary in the breast, which had been amputated. Subsequently, metastases had developed in the lymph nodes and in the liver, and had then undergone a gradual and spontaneous retrogression. With the shrinkage and disappearance, a portal obstruction developed, necessitating the removal of a large amount of chyliform fluid at intervals of 10 to 14 days. This fluid was used on the supposition that it might contain immune substances.

Following its injection into cancer subjects there was a considerable local reaction in the tumor, consisting of swelling, redness, necrosis and shrinkage of the growth. So far as I am aware, the shrinkage in growth was always temporary in character.

Similar results have been obtained by others with sterile washed blood corpuscles of alien species, the good results with this method also being temporary in character.

Weil made a careful experimental study of cancerous and non-cancerous pleural and ascitic fluids, but was unable to demonstrate any difference between them.

The subject of specific chemo-therapy, as developed by Ehrlich, is of such fundamental importance that it is not surprising similar studies have been made toward obtaining a cure for cancer.

If we concede that the cause of cancer is not parasitic, then it is necessary to find some substance which is capable of destroying or inhibiting the growth of cancer cells, and which at the same time is

non-toxic for normal cells. Such a substance Wasserman, Keyser and Wasserman apparently have found.

While testing the viability of cancer cells in sera from normal and cancer patients they observed that the salts of salemium and tellurium are taken up selectively by the tumor cells.

In their first experiments the drug was given intravenously, but the desired results were not obtained. They thought this was due to the fact that the drug did not get into the tumor, and made other experiments to find a salt which would penetrate into all parts of the body. Such a combination was finally found in a mixture of eosin and selemium, the exact nature of which is not disclosed in their preliminary reports. They gave daily intravenous injections of this substance in doses of 2.5 mgm and after the third day observed distinct softening of the tumor, and by the tenth day, when the growth was not too large, it had entirely disappeared. No recurrences have been noted in those animals which recovered. In their second communication the successful treatment of two mice with large primary tumors was reported. They also state that the tumor did not completely disappear in some of the animals treated, but took on renewed growth following a partial retrogression. These results were ascribed to inactive preparations of the drug. It exerted a marked toxic action in a certain number of mice. The authors have not atempted the treatment of human cancer.

Even if the drug with which they are experimenting does not have the desired effect on human beings, it has opened up for investigation a field which is rich in possibilities.

A New York farmer, having had an unusually prosperous year decided to *do* New York City. He chanced, the first night, to stroll into a Broadway theatre. He went back the second and third and fourth nights and kept going. The ticket taker began to wonder about it and finally told him that of course they appreciated his patronage but wanted to know what he found so interesting in the same show every night.

"Well," said Silas, "you know in that affinity scene in the third act, where her lover just barely gets through the window before the husband comes in?"

"Yes, what of it?"

"Nothing, only one of these nights that son-of-a-gun is going to get caught."

TONSILLAR AND ADENOID AFFECTIONS OF SCHOOL CHILDREN—THEIR DANGERS AND PROPER CORRECTION.*

F. E. V. Shore, M. D., Des Moines.

The faucial tonsils, situated one on either side of the fauces, are two apparently insignificant bodies which from time immemorial have been an inviting field for experimental surgery, and an easy mark for the beginning operator. That their successful removal can be accomplished in many cases by the inexperienced operator there can be no doubt, but universal success attending their removal is the result only of extended experience and the daily observation of faucial conditions. In other words, the best results are obtained by those saturated with the pharyngeal atmosphere, just as the musician excels in direct proportion to his degree of musical saturation. The appearance of a large number of fauces which have been operated upon demonstrates the necessity for more extended experience on the part of the operator, a more extended preliminary examination of the patient, greater care in the performance of the operation, and a keener sense of avoidable discomforts many persons are compelled to endure the remainder of their lives.

The two faucial tonsils, the lingual tonsils at the base of the tongue, and the pharyngeal tonsils, or adencids, as they are commonly called, constitute the lymphoid ring of Waldeyer. The component parts of Waldeyer's ring are so intimately associated that a physiologic or pathologic process in one is usually accompanied by a similar condition in the other parts of the ring. So uniformly are the changes of these parts associated, that it would seem as though they depended upon a common general condition rather than a strictly local one. As the result of pathological changes in this "vicious circle," there is developed an hypertrophied condition of the tissues, and obstruction to the free passage of air occurs, with deficiency of oxygen and moisture. The patient breathes through his mouth, develops a broadened nose, anxious expression, thickened lips, and in aggravated cases, a high, narrow maxillary arch, with much deformity of the superior maxillary bones. When once these oral changes have occurred, the correction of the pathology of the Waldeyer ring will not suffice to produce desired results, but must be supplemented by the efforts of the Orthodontist. However, in the aggravated cases even his best efforts are of no avail in lessening the deformity, and the patient is compelled to go through life respiratorally crippled, as the result of failure to receive proper attention sufficiently early.

Many of these cases presenting the symptoms complex of tonsil-

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lar and adenoid obstruction are too hastily examined, and the presumption of the obstruction being due to the faucial condition arrived at without a search being made for other essential factors in the case. Too often examinations subsequent to the tonsillar operation reveal a deviated septum, nasal spur, hypertrophied turbinate or foreign body in the nasal passage as the prime factor in the case; and as the obstructive symptoms have not been benefited by the tonsilectomy, the patient is once more subjected to operative interference. It is not always easy to make a nasal examination of a struggling child, but certainly before proceeding with the tonsilectomy, while the patient is under the anaesthetic, it is an easy matter to determine the nasal condition and substitute the nasal operation for the faucial if the obstruction is nasal in origin.

It is possible that more extended observations on the causation of hypertrophies of the components of Waldeyer's ring may materially alter our ideas as to the necessity of surgical interference in this class of cases. Geo. H. Wright, in an able article in the Boston Medical and Surgical Journal, calls attention to the relation between tonsillar enlargement and the eruption of the four groups of molar teeth at two years, six years, twelve years and eighteen years. It is his contention that the hypertrophies are physiologic, and that with proper prophylactic treatment, so as to prevent any aggravation by infection, the tonsils will return to their proper size after the eruptive period has passed. In support of his position he records 150 cases treated successfully by careful attention to the eruptive periods, without removal of the tonsils.

That there is a very intimate relationship between the teeth and tonsillar infections I have had demonstrated sufficiently often to preclude their being coincidental. One of my patients on whom I had advised a tonsilectomy consulted his dentist for a severe continuous pain in one of his teeth. His dentist found the tooth perfectly normal, and could account for the pain in no other way than that it was tonsillar in origin. The pain continued for three days, when he permitted me to remove the tonsils; cessation of pain immediately followed the excision of the tonsils. Another striking example of dental pain of tonsillar origin occurred in one of my patients who consulted me for a cyclitis or so-called "rheumatic eye." I advised the removal of the tonsils for his rheumatic condition, but he was skeptical about my theory of the tonsillar origin and submitted to confinement in the house for three weeks anti-rheumatic and local eye treatment. His eye condition had not made any material improvement under my judicious treatment, but to add to the sum total of his misery, he developed a severe continuous pain in his tooth. His dentist was summoned, but

could find no trouble. I had him consult the dentist who had examined the former case, and he pronounced the tooth sound. So it was "up to me" to remove the tonsils. The pain in the tooth subsided immediately after the operation, and in three days his eye was well. I have had two other patients who developed pain in one of the teeth, and in each case prompt relief followed tonsilectomy. I do not pretend to say whether the pain was reflex or the result of lymphatic involvement, but I believe the latter to be the case.

Dr. Wright's theory may not be correct, but I am firmly of the opinion that as throat specialists we pay too little attention to the toilet of the mouth and are too prone to prescribe gargles, especially after our tonsilectomies, which can in no way affect disease germs other than give them an agreeable, gentle ablution. If our tonsilectomies were preceded and followed by very frequent scrubbings of the teeth, gums, mouth, etc., by cotton pledgets dipped in some well-recognized antiseptic solution, much would have been done to prevent infection.

I mentioned the rheumatic eye as being due to tonsillar infection, but I do not wish to be understood as singling out this particular rheumatic condition as alone due to this portal of entry. On the contrary, I have seen several cases of muscular and articular rheumatism yield to tonsilectomies. The relief is not as prompt or as pronounced as in the cases cited, but the relief is sufficiently marked to leave no doubt in the observer's mind. I fully realize that rheumatic conditions may originate otherwise than through the tonsils, but I am satisfied a large percentage arise in this way.

I would especially call your attention to the fact that the offending tonsils in rheumatic and other infectious conditions are not of the large, prominent type, but rather the submerged or the insignificant stumps.

I think it is generally conceded that cervical adenitis is always tonsillar in origin, and when present calls for prompt removal of the offending tonsils, with a reasonable degree of certainty that the cervical infection will subside with the arrest of the supply of infectious material. In May, 1911, a severe epidemic of streptococcus angina of the cervical glands affected 1,043 Boston children, resulting in 48 deaths. The disease was marked by very unusual angina, with streptococcus as the etiological factor. A similar epidemic raged in the vicinity from which Boston obtained its milk supply; and although the sanitary inspection of the milk supply of that city is unexcelled, the consensus of opinion attributed the spread of the infection to the milk. Last fall we had in widely distributed points in Iowa a somewhat similar outbreak of severe cervical angina, but I am not aware that the etiological factor was in any case determined. In the 48 deaths occurring in this

epidemic there was presented a very convincing picture of the dangers to remote parts from tonsillar infection—nephritis, pneumonia, pericarditis, thrombus, cerebral abcess, and general septic infection. Mastoid and cerebral abscess are very frequent complications, owing to their more intimate lymphatic connection.

The infections of the various exanthematous diseases usually enter by this route; and while removal of the tonsils lessens materially the susceptibility to contract these diseases, they may and do find entrance through the alimentary tract. Tuberculosis of the tonsils seems to be a very rare condition, but the passage of the tubercular bacilli to the lymph glands has been frequently demonstrated.

I have called your attention to the possible intimate relationship existing between Waldeyer's ring and the periods of dentition, but I wish to direct your attention more particularly for a few moments to the close relationship which exists between the tonsils, lymph nodes, thymus gland, lymph elements of the spleen, and lymph marrow of the long bones—the condition known as "status lymphaticus." This complexity of hyperplasia has been held responsible for the majority of deaths following various operations, especially tonsillar. Unfortunately the diagnosis of this condition has been made on the post-mortem table, although efforts at anti-operative diagnosis by the X-ray are being pursued with a reasonable hope of success. Seven cases of death from "status lymphaticus" during ether anaesthesia have been reported by Blake; McCardie reports 30 fatalities due to the same cause, 17 chloroform, 6 ether, 5 chloroform and ether, and 2 nitrous oxide. Several have occurred during cocaine anaesthesia. A writer in San Francisco reported some 12 deaths from "status lymphaticus" where tonsillar operation was being performed. The pathology as yet seems very obscure, and I am inclined to believe the anaesthetist has been at fault in many of these cases, and that a percentage should be more properly considered as "status anaestheticus."

I myself, had a very unfortunate experience with what appeared to be "status epilepticus." However, it is possible it is closely allied to this class. The patient was a girl of 11, under-sized, over-matured, who had been taking soda bromide twice daily to ward off "grande mal" attacks. I had arranged to remove her tonsils at 8:30 a. m., but was delayed until 9:30. She had had no bromide that morning, neither had she had solids or liquids. She showed no signs of excitement or fear. Chloroform was administered very slowly by her family physician, who was an experienced anaesthetist. After she had had the anaesthetic administered for sometime an effort was made to introduce the mouth gag, when it was discovered she was but partially under. The anaesthetic was again commenced very slowly, with a free admix-

ture of air, when she all at once presented a typical epileptic seizure—cry, frothing at the mouth and spasm. No anaesthetic was administered during the seizure, the pulse was rapid, but when the seizure passed off, coma followed and all efforts failed to revive the patient. I cannot think the chloroform was even an exciting cause; rather would I expect it to allay cerebral excitability. The tiresome wait, lack of food and bromide, were probably the last straws in a very aggravated epileptic.

Other deaths have occurred in this city with other operators, directly or indirectly as result of tonsilectomy: one from pneumonia, and two or three others in another office—from what complications I know not. With the dangers from an anaesthetic peculiar to this class of cases, the dangers from excessive hemorrhage, from injury to uvula and pillars, and infection—when all these dangers are considered, it behooves us to investigate each case well before advising the removal of an organ which in many cases may be nothing but a physiological process aggravated by preventable means.

I would not have you understand me as belittling the benefits resulting from the removal of hyperplasias of Waldeyer's ring and the spread of information tending to enlighten parents on the dangers attending infections through the tissues of that ring. Even calling the attention of parents to the baneful results in any given case would benefit many; but the exclusion of children from school who fail to submit to operative interference when they in no way jeopardize the health or comfort of their fellow-students is un-American, productive of much prejudice and harm, and a sufficient excuse for the existence of a fresh crop of enemies to our profession and our practices, even though literary Boston and other less luminous bodies have "blazed the way."

A small boy, with a rather lost and lonesome appearance walked into the county clerk's office at the court house. He gazed about him for a time and finally approached Deputy Henry Smiley.

"Please, sir," the lad said timidly, "have you seen anything of a lady around here?"

"Why, yes, sonny," answered Smiley, "I've seen several."

"Well have you seen any without a little boy?" the lad asked anxiously.

"Yes," replied Smiley.

"Well," said the little chap, as a relieved look crossed his face. "I'm the little boy, where's the lady?"

—Denver Times.

THE MEDICAL ASPECT OF IOWA.*

A. G. FIELD, M. D., DES MOINES, IOWA.

(It is with no small degree of pleasure that we reproduce an article written by Dr. A. G. Field of Des Moines, and published in the Chicago Medical Journal, April, 1867. It came to us only a few days late for last month's issue but we give it a silver anniversary just the same. We know that old and young alike will enjoy the article.

Dr. Field located in Centerville in June, 1850 for the practice of medicine. The topographical and climatic conditions alluded to in the article were such as prevailed in that locality at that time. Few men live to see the reproduction of their writings twenty-five years later but Dr. Field is still actively interested in medical progress and we offer this as a comparison with present day writings.—Ed.)

By nature, Iowa has been liberally endowed. Its rolling prairies stretching out in graceful undulations, like the waves of the ocean; its beautiful rivers flowing along their deep, well-washed channels; and its perpetual breeze, scented in summer by the fragrant breath of an endless variety of wild flowers, are all characteristic. So, also, are the fine development, the health, the energy, and the vivacity of her citizens.

On the map, Iowa extends from 40° 20′ North, to 43° 30′, embracing about 3 degrees in the middle of the North Temperate Zone, and the climate is not less salubrious than is thus indicated by its position. The mean temperature in summer, is about 70° Fahrenheit, and that of winter, about 20°. Rain is almost always accompanied by a sensible diminuation in the temperature of the atmosphere.

Iowa is, emphatically, a prairie state, not, however, abounding in the broad and monotonous prairie plains of her sister on the east, but in prairies of less area, which approach a level on the high lands, but become more undulating and rolling in the low lands and near the water courses. The highest prairie is, therefore, often wet and cold, and less fertile than that which is more undulating. About four-fifths of the area of the State is prairie land, which, in summer, is clothed with the most luxuriant growth of vegetation; and if the waves of the ocean, sparkling in the sunbeams, *seem* to be clothed in sparkling gems, those of dry land *are, indeed*, in the more varied beauty of the endless variety of wild flowers which adorn them.

Sloughs are an interesting feature of a prairie country. In the absence of more desirable water, they furnish a supply for very many new settlers, and, although they are mere pools of standing water, they do not become stagnant, nor possessed of malarious properties. This is due, in part, to their depth, as well as to their protection from the heat of the sun by the long grass and their overhanging margins, from the tenacity of the sod, permitting, in many instances, large sub-sod excavations to be formed by the water. Slough water is much more

*Chicago Medical Journal, April, 1867.

palatable than its name indicates to a "down-easter." It has a sweetish, loamy taste, is quite free from the elements of any kind of decomposition, and, so far as I know, is not considered unhealthy.

In Iowa, there are few, if any, large tracts of heavy-timbered land to breathe out their poisonous exhalations into the surrounding atmosphere. The bottom lands are the timbered lands. The streams are all skirted with a belt of timber that, on either side, extends from a few rods to a mile or two, or more, in width.

The atmosphere is rich in oxygen, and from the large excess of vegetable life that feeds upon it, we may, perhaps legitimately infer that it is poor in carbon. I do not know that ozone has been detected in it, but have reasons to believe that it exists. In my own person, respiration, in health, is from 15 to 20 per cent faster in the atmosphere of New York City than in that of Iowa, and many claim to have experienced a buoyancy and elasticity of spirit, upon coming here, that was entirely unknown to them in the Eastern States.

The almost constant prairie breeze augments the severity of the climate in winter, and renders the heat of summer less oppressive. The prevailing winds in summer are from the south and southwest: and in winter from the north and northwest. Southerly winds are usually bland and grateful, but seldom continue long without bringing a storm, often resulting, no doubt, from the condensation of a highly rarified atmosphere. The northwesterns of winter are of much severity, blowing, as they do, parallel with the course of the streams, and being chilled by the great snow regions of the mountains. Northerly winds, are, next to easterly, most rare, and, when they do occur, are of very short duration. Easterly winds occur less frequently than those from any other source, and are also of short duration. They are not cold, but bring a humid atmosphere with them from the great lakes, and are more chilly and intolerable even than those from the north. Westerly winds, in summer time, are always refreshing, and they are more constant than those from any other source. All are extremely variable, and with every change in the direction of the wind, there is generally a corresponding change in the temperature of the atmosphere.

On the whole, the climate of Iowa, although subject to sudden changes, and, to some extent also, to extremes of heat and cold, is not only favorable to general health, but certainly exercises a curative influence over the scrofulous and tubercular diathesis. The constant wind exerts, also a mitigating influence over malarious influences where they exist, and endemics are almost entirely averted.

In enumerating some of the more characteristic causes of disease in Iowa and other prairie States, no allusion will be made to many of those which are confined to the cities and large, well-built towns. In

these, the citizens enjoy the conveniences and luxuries of their former eastern homes, and are subject to many of the causes of disease that they were in them. But "far out upon the prairie," whither the adventurous young farmers go to *make* themselves homes, are to be found those especial influences and causes of disease to which we would allude. Here, the infirmities of old age and of chronic diseases seldom go. A very large proportion of new settlers are young and middle-aged, have good constitutions, and the "snap" of energy. Society is made up from the more healthy and ambitious people of communities in other states and countries, each bringing the peculiar manners, customs, and mode of living of his nationality. Diversity in these things, results in diversity in the causes and complications of disease. The physician must study his patient as well as his disease.

The pneumonia which attacks a robust man who has labored all through the heat of summer and the cold of winter, is quite a different disease, considered therapeutically, from that which attacks his friend of sedentary habits just from his warm house in an eastern home. And so, too, is the dysentery of the child just from its native home in Georgia, with relaxed fibre and impaired nervous force, quite a different disease, therapeutically considered, from the dysentery of another child, whose athletic frame and smutty face speak of the privations and neglect and simple mode of living of its native new country home. In newly settled countries, common privations in living as well as in the pursuit of accustomed avocations, are met in various ways; thus originating new influences and causes of disease, as diversified almost as are the individuals themselves. And besides these, the great differences in the habits and predispositions of individuals from different States and countries, demand of the physician the most attentive observation and careful study. With this allusion to some of the causes of disease which relate to the subjects of it, we will proceed to notice some of those which more properly belong to a new prairie country. Pre-eminent among these may be mentioned the dwelling houses.

Many new settlers live for a year or more in small, open, half-finished houses, of but a single room, in which to live, sleep, cook, eat, and wash, with no out-houses, and with slough water for family use, which must be carried from one to three hundred yards. That the exposures incident should result in inflammatory and other diseases, is obvious; and then, in addition to the other uses of the already overcrowded little room, it also becomes a sick room. O, how the heart has ached a hundred times in such a sick room. The only wonder is that any in it should live, to say nothing of the sick.

Other especial causes of disease result either directly or indirectly from the great excess in the vegetable form of life, affecting in obvious

ways the constitution of the atmosphere. The animal subsists by extracting the oxygen in respiration, and exhales carbon. The vegetable subsists upon carbon and exhales oxygen, chiefly; the one form of life thereby constituting the atmosphere for the subsistence of the other, and each being indispensible to the well-being of the other. The wind is constantly equalizing the proportions of the atmospheric elements; but a great excess of either form of life in a given quantity of atmosphere obviously operates to diminish the proportion of the peculiar elements upon which it subsists, as well as to increase the proportion of the elements evolved by it, however great the diffusibility of these gases.

That this conclusion is not altogether hypothetical may derive some support from the experience of very many who in a prairie atmosphere have realized its exhilarating effect. A new energy and motion seem often given to the whole man, mentally, as well as physically, and even old people bending under the weight of many years, have been known to regain much of the vivacity and activity of early life upon removing to a prairie state, and to continue to enjoy for years a degree of health as gratifying as it has been surprising. In the absence of any demonstration by analysis, have we not some ground for the conclusion that the atmosphere of Iowa is rich in oxygen? But how far, or under what peculiar circumstances this fact may relate to disease as well as to health, we will not now attempt to determine. But if it is true that the existence of this excess of the vegetable form of life exerts an influence upon the constitution of the atmosphere, it is equally true that its sudden destruction, or the decomposition therefrom resulting, must produce other and equally important changes in it to affect the animal economy.

An autumnal frost blights in a single night the grassy domain of an hundred prairies, and reverses the whole order of nature's phenomena. The laws of chemical change triumph over those of vital change, and the living, breathing plant, becomes at once a mass of incipient decomposition, oozing at every pore the putrid gases of decay. But comparatively, only a very small proportion of prairie grass is permitted to undergo slow decomposition. Nature provides a more speedy and fortunate means of resolving it back into the original elements, in the great prairie fires that sweep, and sometimes with thundering fury, over hundreds of square miles in a single day, and continue their devastating march for days and even weeks without abatement. The result is that large quantities of smoke, and vapor, and carbonic acid gas, are suddenly liberated into the atmosphere to pervert and discase the functions of animal life. Coincident with the occurrence of frost and of prairie fires, begin also the more serious cases of autumnal

diseases, dysentery, cholera-morbus, and intermittent and remittent fevers. These fevers generally evince a marked tendency to the typhoid form of disease if not arrested early, although idiopthic typhoid fever rarely if ever occurs. We are accustomed to call the typhoid form of disease typhoid fever, simply because it is convenient to do so. Other causes no doubt are largely concerned in the production of these diseases, even in Iowa, but because of their universality we make no allusion to them in this article. Another means by which a large amount of prairie grass is caused to undergo decomposition every year, is by "prairie breaking." The sod, which is a dense mat of vegetable matter and earth, from three to six inches in thickness, as well as the luxuriant growth of the season, is caused to undergo decomposition in summer time, and as a consequence a malarious emanation is evolved. All over our young State, the energetic farmers are every year making large inroads upon the "raw prairie," with the prairie plow. That this decomposition is a fuitful source of malaria, is evident in the fact that families living near recent breakings, during a summer and autumn, seldom escape malarious disease. I think I have never known a family to escape, who lived near by, and north or east of, a large breaking during a summer. In Iowa, malarious poisoning, from whatever source originating, does not occur in the malignant or intensified form that it does in some malarious districts in other States; but wherever there is heat, moisture, and decomposing organic matter, we may expect to have malaria in greater or less amount, and if Dr. Salisbury's doctrine be true, perhaps we may regard even it as an example of nature's provident goodness, exhibited in an effort to again tie up into organization the elements which have just been set at liberty, and which are so detrimental to the perfect well-being of the animal economy. The water courses, as a source of such emanations in Iowa, are not sufficiently dissimilar from those of other States to deserve much consideration. They have, generally, high, abrupt banks, and are skirted with belts of timber to drink up, to a great extent, the elements of their miasmatic emanations. But bottom lands, subject to overflow, as well as swales and pools of standing water along the course of, and near, the streams, are a very common source of miasmatic poisoning, and families exposed to either of these in summer time seldom escape.

The causes of inflammation, to some of which allusion has already been made, are, perhaps, more numerous and more potent for evil than are those of any other class of diseases. They occur most abundantly in winter and early spring, but from the very nature of the conditions upon which they depend, they are in perpetual operation. These are, firstly, a predisposition by the plethora and the habits of a large majority of the people. Secondly, exposures incident to small, unfinished,

and insufficient houses; and, thirdly, the sudden reduction of the temperature of the atmosphere, by the frequent changes in the course of the wind. Of this class of diseases, the following may be mentioned as most common, in the order in which they are enumerated, *viz.*:—Catarrh, pneumonia and pleuro-pneumonia, croup, conjunctivitis, erysipelas, meningitis, gastro enteritis, etc. Like malarious diseases, some of these also have a marked tendency to assume the typhoid form early, and although decidedly sthenic in the onset, the antiphlogistic treatment is required with exceeding caution in very many instances while others will not bear it at all.

Epidemics have nothing peculiarly characteristic in them. What may, I believe, be said of all epidemics, is especially true of those which have prevailed in Iowa, *viz.*:—that the first cases are attended with the greatest fatality, with a decreasing ratio in proportion to the length of time which they prevail. The diseases which have most frequently assumed this form are, diphtheria, dysentery, erysipelas, and scarlatina. Diphtheria has prevailed with much fatality, especially with small children, in the last five years. Cerebro-spinal meningitis, in some localities, has also been attended with much, and even greater, fatality, in proportion to the number of cases, than any other disease of which I have any knowledge. The first epidemic of it occurred in the winter of 1863-4, since which it has occasionally manifested itself in some portions of the State.

There is another predisposing cause of disease in Iowa, about which nothing, so far as I know, has been said, and yet which should not be overlooked. It is the want of a properly acidulated diet in spring time and summer, the result of which is, probably, an abnormal constitution of the blood. I do not pretend to know just what this abnormal condition consists of, but it has been clearly and repeatedly demonstrated that the use of acids removes it. We know that the blood does sometimes possess an abnormal alkaline reaction, and that most acids, when ingested, enter the circulation as such, and combining with the salts of soda and other bases, restore the blood to its normal constitution. We know, also, that the capillary circulation is enfeebled, and that there are other morbid phenomena which attend these cases, in hypinosis, and again the acids, especially the mineral, are restorative by increasing the fibrine and albumen, and, thereby, also the circulation in the capillaries.

Whether either of these conditions of the blood, *viz.*:—its abnormal alkalinity, or its want of a due proportion of fibrine and albumen, is the condition under consideration, we do not venture to assert; but that the change of seasons brings about a demand on the part of the bodies of both man and animals, for a change in the constitution or quality of food, and that such demand is, most happily, responded to on the part of nature by the varied provisions of her storehouse, is beyond question.

Fruits are a necessity as well as a luxury, and nature supplies them just when they are most needed, but not to the prairie pioneers, who, having ventured beyond the limits of her provident fruit garden, as well as those of the fellows, must plant, and prune, and wait for—his own.

SCHOOL SANITATION AND MEDICAL INSPECTION OF SCHOOLS.*

E. E. DORR, M. D., DES MOINES, IOWA.

It was my intention to go into the sanitary study of school buildings, grounds and ventilation, but I believe this belongs to the Sanitary Engineer. But by experience, education and environment, we—the Medical Profession—are the Sanitary Engineers, with the exception of a few, who have had the keen insight to recognize that this branch of science would be more fully developed, and hence have made some special study.

We do not wish to limit our study of schools and children, to cities, either of the first, second or third class, but our efforts should reach to the isolated country school house, in the rural districts, as well.

We may pass them with less discussion, but they need timely help, in view of the lack of financial support as compared with city schools.

How often do you admire the country church and its location of prominence, as you drive through the rural districts, and how often do you come upon a small, illy kept school house surrounded by dense trees and located in grounds insufficient for play purposes, or located on some cheap plat of ground with no evidence of any interest in its beautification or attractiveness. The one, used probably but a part of one day in the week; the other, five days a week. The one, private and kept attractive; the other, public and little considered from the asthetic standpoint.

Can you remember the double privy building with its vault open to all the pestilential opportunities of contamination?—never screened and seldom cleaned.

The one advantage that the country school has over its city mate is light and ventilation, and yet, both are subject to the same criticism, that they exclude fresh air that a record may be made in fuel expense. Yet we may doubt the beneficial workings of either in many instances.

"The school room," says Shaw (School Hygiene) "should be the unit first to be considered, and the school house, a collection of school rooms." He sets the standard for a school room, at "15 square feet of floor space and 200 cubic feet of air space for each pupil." The school room for 40 to 48 pupils should be 30 feet long, 25 feet wide and 13 feet high. The light should be on the side (left preferably) and rear, and the windows should reach from the ceiling to within 3 or 4 feet of the floor. Two reasons for placing the windows high; for the better diffusion of the light with less shadow, and, easy ventilation of the room, as the warmed and poluted air will flow out of the window (if opened), "like liquid from the bung-hole of a barrel."

"Dust is a serious problem in ventilation. Many ventilating systems are worse than useless because the air is taken in at or below the

*Read before the Polk County Medical Society, March 27, 1912.

street level or from other contaminating sources, and is passed into the building without filtration, the result being that the last state of the building is worse than the first.

There are two phases to the dust question: the mechanical effect of dust, and its germicidal properties. Careful investigations have demonstrated that dust, especially street dust, is heavily laden with germs, the majority of which are harmless but others are of a most serious nature. Carried into the respiratory tract they lodge in soil splendidly adapted to germ life. Dust is a serious irritant, and when drawn into the nasal passages, throat and lungs, may cause irritation and even abrasions. The mortality from consumption is known to be very much greater among persons employed on the so-called dusty trades than among those who work in the open air, or under otherwise more sanitary and favorable conditions affecting health and life.

Windows and doors may be depended upon for ventilation of buildings only when it is evident that sufficient current of air passes through to give thorough ventilation and without causing drafts which strike and chill a portion of the body of those who are insufficiently clad. If sufficient air is not naturally passing through the windows and doors, air movement should be assured by mechanical means.

Drafts and cold are too commonly associated with "colds." Breezes which bathe the whole body not only bring unlimited supplies of the purest air but have a tonic effect. Cold air does not cause "colds." Arctic explorers rarely, if ever, have colds. It is during the winter months that outdoor treatments are the most successful. The places most to be feared are not out of doors, in hallways and in fresh air currents, but in vitiated atmospheres such as are common to ill-ventilated schools, theatres, churches, railway cars and wherever overcrowding occurs."

The matter of cleanliness and sanitation embraces not only the fresh air and health of the pupil, but the play, the drinking cup and the medical inspection of children.

The Public Health Movement, March, 1911.

Leonard P. Ayres gathered statistics for the Russell Sage Foundation regarding school conditions in the United States. We use the following table.

Number of Cities in Which the School Room Floors are Washed and Swept and the School Room Windows Washed with Frequencies Indicated.

Frequency	Cities where floors are washed with frequency indicated	Cities where floors are swept with frequency indicated	Cities where windows are washed with frequency indicated
Daily	1	574	1
Once in 2 days	1	49	1
Once in 3 days	3	86	—
Weekly	36	6	22
Once in 2 weeks	27	2	8
Once in 3 weeks	8	—	5
Monthly	135	2	117
Once in 2 months	50	1	84
Once in 3 months	140	—	139
Once in 5 months	115	2	111
Once a year	57	—	31
As needed	68	10	139
Never	44	—	5
Not reporting	73	26	95
Total	758	758	758

Scrubbing once a month, is done in 20 per cent of schools; once in three months, 20 per cent; while 8 per cent scrub but once a year. 80 per cent of the schools are swept daily; 10 per cent of the schools are swept twice per week, while two schools sweep but twice during the school year. Only 10 per cent of the schools have vacuum cleaners, others use wet saw dust (if handy) or a sweeping compound, while the rest is done by the dust distributing process. 50 per cent use damp cloths in dusting, the others displace it for cosmetic effects only.

Medical Inspection.

Inspection of school with occasional reference to health conditions of the pupils dates back to Prussia, 1832 and Sweden, 1832, with the result that the school hours were lessened; and Paris, 1833. Since then every civilized nation has taken such an interest in their schools that the physician is consulted more and more frequently.

In 1884, Prussia added to the duties of medical inspection the reporting of contagious diseases.

In our country, the first effort along the line of physical inspection was made in Boston, 1892, but it was two years before any practical work was accomplished, when 50 physicians were appointed, one for each of the 50 districts into which the city is divided. The work was done under the Board of Health.

In Philadelphia, the Bureau of Health appointed 15 physicians. Connecticut, New Jersey, Vermont and Massachusetts have laws regarding medical inspection of school children.

In 1890, the Boston Board of Health proposed to furnish "daily medical inspection," but lack of funds prevented work until 1894, when a rule was passed that "Teachers should report to principals, the physical examinations; if the child was too ill to remain, he was sent home with a note to the parent; if disease was contagious, the Board of Health was notified. A department of School Hygiene was formed in 1908, by the Boston School Board, "to control medical inspection, (except that under the Board of Health) school nursing, physical training, athletic games and general welfare of school children." Even this early we see the recognition of the "Play Master."

This plan was largely adopted by New York in 1897, with the addition of nurses. Chicago had a similar plan in 1895, but no funds were available and nothing was accomplished until 1899, when 50 medical inspectors were appointed to work under the Commissioner of Health.

Of the numerous examinations of children, from 1898, reported, we can safely estimate that 35 to 40 per cent defective. Cohn, in *1865*, found in the examination of 10,000 school children for eye defect, that 1 per cent were myopic on entering school, and that the defect in-

creased noticeably up to the 14th year in school, when it reached 63.6 per cent.

Others have reported the percentage in American schools as high as 39. Examination of the school children of Buffalo showed that at age 7, 5 per cent; at 11, 11 per cent; at 13, 19 per cent; at 18, 26 per cent; at 21, 43 per cent; myopic and that 12 per cent were hypermetropic.

As early as 1876 Dr. Loring, Jr., of New York, discovered myopia in the primary grades and found that it increased in the higher grades. Callan, New York, found myopia in colored school children, between the ages 5 and 19, amounting to 26 per cent.

In Minneapolis, the Snellen Card is in use. The first years examination here of 25,696 showed 32 per cent defective. Hearing was also found defective in 17 per cent to 30 per cent.

Japan had school physicians in 1893.

Boston claims the priority in medical inspection in the United States. In addition, was probably the first to add to the inspectors duties, the study of physical defects. The first report of Boston schools, '96, covered 108,226 inspections and there were found 6,829 cases of infectious or contagious diseases, 6 per cent. In '02, 50,000 children were examined and 6,770 cases of Ophthalmia were found, 12 per cent, and it was this year that provision was made for the inspection and examination of each child.

The claim is justly made that medical inspection has paid for itself in the prevention of epidemics. Now, throughout Massachusetts a compulsary law, for tests for hearing and eye sight, is established. Upon the first inspection, it was learned that 30,000 out of 97,000 children, examined, were defective in vision.

In Germany, '97, a report shows 26 to 34 per cent of disease among the boys and 25 to 50 per cent among the girls. Myopia, 13 per cent, was the leading trouble; chlorosis, curvature of the spine, etc., were the main troubles with the girls.

In New York City, '01, nurses were added to the school and all children, examined. In the examination, March 31, '05, there were found 17,710 cases of Trachoma; this was reduced to 12,000 by March 15, 1906. An inquiry was made into general health conditions, presence of nervous diseases, mental deficiency, deformaties, affections of teeth, nose, throat, eyes and ears. The report of the first thorough examination was on 99,240 children with the result that 65 per cent were needing medical aid. 30 per cent defective in vision, 40 per cent with dental defects, 20 per cent with swollen glands, 20 per cent with enlarged tonsils, 1½ per cent with adenoids, 1½ per cent with heart dis-

ease, 1 per cent with lung trouble 2½ per cent with deformaties and 2½ per cent were mentally deficient.

Ninety-five per cent of the "backward children" and mentally defective have physical defects which can be remedied. 87 per cent of the truant children had physical defects. 85 per cent of the children in the Juvenile Courts had physical defects.

In Chicago, 1895, 9 inspectors were appointed. Their first examination covered 233 public schools, and 1417 cases of diphtheria and 206 cases of scarlet fever were found. During the next school year 4,023 cases of contagious diseases were found.

In 1890, 50 inspectors were appointed and the plan, proposed by Boston was followed.

In New York, in one year, there were 57,986 exclusions made on account of diseases among the children. No provision was made for the treatment of the children, and they continued to play with the other children, and to remain away because of lack of attention, usually due to the poverty or opposition of the parents. A nurses settlement offered services for treatment and 829 were cared for in the month. This lead to the appointment of 35 nurses to care for the children, at home if necessary, to follow up and cure. No examination is made in the class room, but suspects are sent to the inspectors office for examination; if contagious, it is reported to the District Inspector, who sees the child in the home for dagnostic purposes. Children absent from school are also visited. A definite diagnosis and prescription is given by the physician, and the nurse gives treatment, either at school or at child's home. In 1904, cases treated, were 783,685.

"An unexpected problem presented itself in the occasional refusal of children and parents to permit treatment. This was met by the district superintendent of schools, co-operating with the district attorney, who declared that any parent who refused to put a child under proper treatment, was committing a violation of the compulsory education law, and was punishable by fine. A test case was brought and the father fined $10.00."—Annals of the American Academy of Political and Social Science.

In 1908, Edward L. Stevens, in Worlds Work wrote, "We are just beginning to discover the corrective effect of play on fatigue, malposture, defective circulation and similar evils." And in speaking of these children, he says, "We permit their parents to breakfast them on stimulants and starch, to lunch them on seed cake and pickle, and to dine them upon canned stuff and Packingtown products."

W. H. Alle nwriting in Atlantic Monthly, '08, says, "In the near future, School Hygiene will suggest practice not precept. Not class room recitations by pupils, but control of school environment by school authorities."

Ella Richards, writing in Outlook, August, '03, says, "In almost every case, it is the children who are sacrificed, who are dragged by the truant officers from the sunlight and free air of the streets into stag-

nant, dull, ill-smelling air, which no board of Charity would allow in an alms house."

G. W. Wharton, Outlook, '06, speaking of defectives in the class room, makes this summary,—"1st—the child degenerates, 2nd—the class is hindered, 3rd—the teachers work is made harder and less effective."

Quoting from Nation, '07, "It is folly to supply books for those who cannot read them, or to place children in class rooms where they cannot see what is written or drawn on the blackboard. If sight is defective, the child is hopelessly handicapped."

The school nurse, "The sister Confessor and High Priestess of Right Living," will soon displace the medical inspector, as well she may, for her record is an enviable one.

Wherever she has entered the school, health and happiness have followed. Little progress was made in school child-inspection until the nurse was added to the working force. She it is, who intercedes in the home for professional attention to the child, conducts the child to the dispensaries, bathes, disinfects and returns the child to the school room.

Provision for the treatment of eye and ear defects have been made in many of the cities, adding much to the comfort and progress of the child. (Philadelphia, Boston.)

It was the prevalence of disease in the schools that first stirred the authorities to action and called for medical inspection. It was the lack of cure, and inattention on the part of the parents, that called for the nurse. It is the disregard for sanitary and physical findings, that is now calling for the play master and the open air. The public school is a public trust, and the old and obsolete methods of compelling all children to follow the same rules, must end. The child according to his ability, both mental and physical, must be recognized.

You may be interested in a report from our own schools. In November, '05, this society appointed a committee to visit the school buildings of the city, and report on their sanitary condition. That committee did its duty, visited most of the schools, and with an expert, Dr. Ross, secured cultures from many of them.

Petri dishes were exposed in 24 places in the different school buildings, and it is interesting to note the difference in results. From the dish exposed in room 11, West High, there were found 93 colonies. From room 5, Emerson School, there were found 1,320 colonies. I may add, parenthetically, that we exposed a petri dish in the street car from 6th and Walnut to University Place and its examination proved negative. The superintendents, (there were two of them) gave the committee free entrance to all the buildings and were anxious to know the conditions from outsiders.

Few physical defects were noted.—Much speculation was indulged in, regarding ventilation, and the health of the pupils was noted

generally, as good. There was at that time, one nurse doing duty on the west side. Since then two nurses, and of late, three nurses are in constant attendance, visiting schools regularly, and the superintendent informs me that there has been some improvement in the appearance of the children the days the nurse was due. Occasionally the nurse gives baths to the children and the needy ones either take notice or are absent at the time of her visit. There is no noticeable increase in attendance as the result of inspection, here.

The children are looked over in line. If any seem sick they are sent to the nurses room, for further inspection. If, between visits, a child is taken sick, or suspicioned of having some contagious disease, the teacher sends him to a room, to await the arrival of a nurse. The nurse does no treatment, but follows the child to the home, and urges treatment by the family doctor, or accompanies the child to a dispensary. 352 children last year were treated at the dispensary. This is 2⅓ per cent of the total attendance of the schools.

Six hundred forty-two, or practically 5 per cent, were found to be diseased. In case of sickness, the child is excluded until a certificate from a doctor is secured.

I append a table showing Nurses Reports, for '09 and '10, and '10 and '11.

Eye Cases	90	145	Unclassified	41	——
Ear	16	45	Pediculosis	1090	167
Throat	165	87	Sent to Bath	103	58
Nose	——	18	Home Visits	87	238
Children's Diseases	84	70	School Visits	1210	522
Free Dispensary	183	532	Dressings—First Aid	——	522
			Referred to Charity	——	18

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Vol. XVIII Des Moines, May 15, 1912 No. 11

Sixty-first Annual Meeting of the Iowa State Medical Society.

The sixty-first annual meeting of the Iowa State Medical Society, at Burlington, Iowa, May 8, 9, and 10, 1912. Three hundred and seventy-five physicians and guests registered.

Many visitors from Illinois were personally interested in the meeting.

An unusually large number attended the sessions and showed their appreciation of the papers read.

The papers were too long to allow of the free discussion they deserved.

Very few men who had accepted places on the program were absent.

The president's address was listened to with marked attention by a large audience.

The addresses on Medicine and Surgery found a quick response in the active brains of the membership.

Numerous papers advanced new and acceptable methods of treatment, particularly that of Dr. L. E. Kelley of Des Moines, when he advised injecting the blood drawn from the parent, into the hemorrhagic new born; and when Dr. Macrae of Council Bluffs advised Caesarean section for Placenta Previa.

The lecture room of the Congregational church proved to be unusual from an acoustic standpoint. No street noises disturbed the speakers and every word could be plainly heard in the farthermost parts of the room.

For the first time in the memory of man, no smoking was permitted in the auditorium.

A large delegation of lady doctors graced the sessions.

The House of Delegates was attended by less than one-half those who were elected to represent their counties.

Forty-two delegates and councillors attended to the election of officers and the changes of the by-laws, etc.

An additional assessment of $1.00 was added to each member's dues to care for the defense fund.

The publishing of the proceedings only cost $1,136 more this year than last.

It was necessary to transfer $600.00 from the general fund to the defense fund, in order to meet its increasing expense.

Amount on hand May 1, 1911, was $8,397.00; on hand May 1, 1912, $4,579.00.

No efforts were spared by the profession of Burlington to give every one a good time. The ladies were given a musical and an auto trip, while every one was taken on the steamer up the river, and all showed their pleasure in the trip.

Burlington does things; the doctors and their friends raised $900. with which to entertain the Medical Society.

Perhaps the most interesting thing, aside from the sessions, was the visit to the great dam at Keokuk. More than thirty doctors went down to Keokuk on the noon train Friday, and were met by Drs. Clark, Fuller, Jenkins and others, with autos and driven to the Illinois end of the dam where the plan of dam building was shown, and then escorted to the Iowa side where the enormous lock is being constructed,—this lock, by the way, is larger than any on the Panama Canal,—and where the power house and turbine engines are being placed. The whole is so stupendous that it should not be talked about by an amateur.

Dr. V. L. Treynor of Council Bluffs, was elected president; Dr.

J. W. Osborn of Des Moines, was elected secretary, and the date of the next meeting set for the second week in May, at Des Moines.

Our revenues will be recuperated next year from the use of advertising in the Journal of the Medical Society.

Burlington is a beautiful city and her people most hospitable.

The House of Delegates resoluted against division of fees and contract practice.

A. M. A. NEWS.

The American Medical Association will meet in Atlantic City, New Jersey, June 4 to 7, 1912.

Official Route.

The Pennsylvania Road has been selected as the official route from Chicago, and the Iowa delegation will have two Pullmans, forming a part of the A. M. A. Journal Special, leaving Chicago 3:00 P. M. Sunday, June 2nd and arriving at Atlantic City early next afternoon. The train will consist of Compartment Observation Car, Standard Sleepers, Library Club Car and necessary Dining Cars.

Rates.

On June 1st, there will be on sale at all Iowa points, thirty day summer excursion tickets to Atlantic City and return, at approximately one and one-half fare, or $29.25 from Chicago, and all Iowa points same mileage ratio. Pullman rates to Atlantic City will be, Drawing Room $18.00, Compartment $14.00, Lower Berth $5.00, and Upper Berth $5.00, and Upper Berth $4.00.

Accommodations.

The rate will be on same basis to New York, and those interested should buy tickets there and deposit them at Philadelphia for stop-overs and re-buy round trip excursion tickets to Atlantic City and continue their trip. In order to do this our special will go via Broad Street Station, Philadelphia.

Tickets will be honored returning via Washington without extra charge, providing they are so routed at time of purchase.

Reservations.

All those expecting to make the trip should write at once for hotel accommodations, to insure satisfactory reservations.

Two twelve section Pullman sleepers have been reserved for our Iowa delegation and as one is now filled, those who wish reservations should promptly notify Dr. J. W. Cokenower, Des Moines, or Mr. L. C. Kimball, assistant Passenger Agent, 175 Jackson Blvd., Chicago.

COMMUNICATION.

Dr. E. E. Dorr,

Des Moines, Ia.

Dear Sir: Your esteemed letter of 23d instant at hand, contents noted. Am enclosing check that you sent me; you can put it on subscription on your esteemed Journal for one year.

About the circular you mentioned, I have been in the practice of medicine for fourteen years; hardly have had a card in local papers and never advertised in any shape and manner, but have tried to get some business through profession, which I did not, not even a case. There were some circulars sent out but I have discontinued the same. I want to mention that I have had opportunity to make a fortune in my practice, but the dollar has never been so close to my eye that I could not see anything, etc. As a matter of fact I am not worth more than six thousand dollars and never had any automobile yet. I expect to be put in quack order now but nevertheless I'd sooner get my business through the testimonials than divide the fee with many doctors that have asked me already, which are doing it right along. You can stay assured that it will not hurt my feelings by dropping my card out of your Journal. I admire you for taking the step.

Am very respectfully yours,

A. OSHANA.

[This communication was received in answer to a letter from the Journal, wherein we refused to carry Dr. Oshana's card because we considered his methods non-ethical.]

SOCIETY REPORTS.

JOHNSON

County Medical Society met with Dr. Scarborough at the Oakdale Sanatorium, May 1st, and after visiting the buildings of the institution held a symposium on the subject of tuberculosis.

WASHINGTON

County Medical Society held its annual meeting in Washington, April 17, electing Dr. S. W. Huston president and Dr .C. A. Boice secretary. The program consisted of two papers, one on "Tonsilitis" by H. C. Hull, and one on "Typhoid Fever" by Dr. Hammer, both being full of interest and receiving full and thorough discussion.

DALLAS-GUTHRIE

County Society held its quarterly meeting at Panora, April 22. Papers were read by Dr. F. W. Bush of Bagley, on "Acute Gastritis," by Dr. S. J. Brown of Panora, on significance of pain in the upper abdominal region, and by by Dr. T. J. Strawn of Des Moines on "The Diagnosis and Treatment of Gastric Ulcer."

JEFFERSON

County held its last meeting in Fairfield, March 29. Following a banquet Dr. Chas. Ryan of Des Moines, and J. V. Bean of Fairfield, read papers.

BREMER

County Medical Society held a special meeting at Waverly, May 1st, for the election of officers. Dr. L. C. Kern was chosen president, and Dr. H. H. Emmis secretary.

BOOK REVIEWS.

THE CARE OF THE INSANE AND HOSPITAL MANAGEMENT.

By CHARLES WHITNEY PAGE, M. D., assistant physician Hartford Retreat, Hartford, Connecticut, 1871 to 1872 and 1873 to 1888, Superintendent Medical Hospital for the Insane, Middletown, 1898 to 1901, Superintendent Danvers State Hospital, Danvers, Massachusetts, 1888 to 1898 and 1903 to 1910, member of the American Medico-Psycholoical Association, etc.; 154 pages; price prepaid, $1.00; W. M. Leonard, Boston, Publisher.

Dr. Page, after forty years of service as Superintendent of the largest hospitals in Massachusetts and Connecticut, has written this volume of 154 pages, to advance the cause of non-restraint and humane treatment of the insane.

DISEASES OF THE EYE.

A manual for students and practitioners.—By J. HERBERT PARSONS, D. Sc., M. B., B. S., F. R. C. S., Opthalmic Surgeon, University College Hospital; Surgeon, Royal London Hospital; Late Opthalmic Surgeon, Hospital for Sick Children, Great Ormand Street; second edition; price, $4.00 net; **P. Blakiston's Son & Co., Philadelphia, publishers.**

The author enters into detail in discussing eye conditions that will interest every practitioner, and even the specialist will find here much to interest him. A very interesting chapter is on "Injuries to the Eye." A page of samples of test wools is given, known as the "Holmgrens Wools for Colour Blindness," also a valuable index.

THE INTERNATIONAL MEDICAL ANNUAL.

A Year Book of Treatment and Practitioners' Index. The contributors amount to thirty-three of the most prominent in the United States; price, $3.50.

E. B. Treat & Company offer the 1912 Annual with the recorded discoveries in medicine. Those who are familiar with the previous annuals will be glad to receive this new one. Much has been added in the way of diagnosis and treatment. Radio-activity receives proper

consideration and some of the latest developments are mentioned. The use of Radium for Naevi and Pruritus is recommended as the best known remedy. The use of Salvarsan is discussed freely. The subjects appear alphabetically and in addition there is a very complete index.

NEW AND NON-OFFICIAL REMEDIES, 1912.

Descriptions of the Articles which have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association, prior to January 1, 1912; published by the Chicago Medical Association, Chicago.

The A. M. A. has gone to much pains and expense to determine the various remedies offered to the public and deserves much credit for its energy.

UNIVERSITY OF PENNSYLVANIA.

Sixth Annual Report of the HENRY PHIPPS INSTITUTE, for the study, treatment, and prevention of tuberculosis; Henry Phipps Institute, Philadelphia, publishers.

MEDICAL NEWS NOTES.

Dr. O. W. Foxworthy has been elected mayor of Leon.

Dr. J. F. Cole of Oelwein, left for California, April 29.

Dr. C. H. Johnson of Alta, was ill with pneumonia in April.

Dr. and Mrs. Fred Alden of Des Moines, are visiting in Kansas.

Dr. F. C. Foley of Newell, has been elected mayor of that place.

Dr. and Mrs. Harry Engle have returned from their California trip.

Dr. S. A. Spilman of Ottumwa, has been visiting in Brownsville, Texas.

Dr. C. H. Johnson of Alta, was confined to his home for two weeks in April.

Dr. D. E. Beardsley has been elected City Physician of Cedar Rapids.

Dr. J. W. Lauder of Afton, is republican candidate for State Senator.

Dr. J. C. Wright of Clear Lake, has re-entered the active practice of medicine.

Dr. and Mrs. W. A. Vincent of Belle Plaine, spent February and March in the south. While there Mrs. Vincent was taken ill with malaria fever and was in a critical condition when she arrived in Belle

Plaine. We hope that her condition has much improved since returning to the north.

Dr. Van Buren Knott of Sioux City, is rapidly recovering from his serious illness.

Dr. and Mrs. W. F. David of Marshalltown, visited in Minneapolis, in April.

Dr. L. M. Conn of Denison, was reported very ill the first two weeks in April.

Dr. H. T. Walker of Dubuque, is recovering from an operation for appendicitis.

Dr. L. B. Carson of Charles City, attended clinics at the Mayo Hospital, in April.

Dr. and Mrs. F. H. Conner of Nevada, have returned from their visit in California.

Dr. A. W. Sherman of Burlington, was in the hospital in April, with a broken leg.

Dr. C. W. Blake of Jefferson, is spending several weeks in Paso Robles, California.

Dr. F. M. Dean and wife of Jefferson, were in Texas during the latter part of April.

Dr. Clara Whitmore of Cedar Rapids, was called to Batavia by the death of her mother.

Dr. C. L. Campbell has been elected surgeon for the Rock Island Railroad at Atlantic.

Dr. and Mrs. W. F. Speers and son Fred of Davenport, sailed for Europe May, 4.

Dr. A. J. Cole of Britt, has announced himself a candidate for State Representative.

Dr. C. L. Patterson, of West Side, returned in April, from a pleasure trip in Tennessee.

Dr. and Mrs. Geo. E. Sanders of Des Moines, were in the south during February and March.

Dr. and Mrs. F. J. Jarvis of Oskaloosa, are spending six or eight weeks traveling in California.

Dr. J. T. Coveny of Oskaloosa, was called to Clinton by the death of his son, H. Ward Coveny.

Dr. and Mrs. C. W. Spaulding of Carroll, are visiting their son, Mortimer, in Denver Colorado.

Dr. C. M. Walters of Bancroft, was in Los Angeles the last two

weeks in April. He joined his wife and daughter who have been visiting relatives in that place.

The Iowa State Methodist Hospital dedicated a very fine, new wing to the hospital, April 29.

The Iowa State Association of Registered Nurses will meet at Davenport, May 31 and June 1.

Dr. and Mrs. Watzek of Davenport, have returned from an extended visit in the south and west.

Dr. W. C. Roberts of Ottumwa, has returned from a two week's visit in North and South Dakota.

Dr. Hugh G. Welpton of Des Moines, has returned from a month's post graduate course in New York.

Dr. J. M. Knott has returned to Sioux City after spending three months touring Egypt, Greece and Italy.

Dr. C. M. Harrington of Knoxville, is taking a rest and a course of treatments at Excelsior Springs, Mo.

Dr. C. C. Shope of Des Moines, has resigned as county physician. Dr. A. B. Morse was appointed his successor.

Dr. W. Fordyce of Fairfield, was called to Libertyville, in March by the death of his father Rev. Lewis Fordyce.

Dr. S. W. Thomas of Newbern, has returned from a vacation spent at his boyhood home in Corydon, Indiana.

Dr. C. W. Sanders of Northwood, was called to Chicago early in April by the serious illness of his daughter, Jennie.

Dr. J. H. Greene of Dubuque, recently presented the physics department of the high school a Toepler-Holtz Static Machine.

Dr. and Mrs. C. E. Hoag of Wapello, arrived home the middle of April after a couple of months spent traveling in California.

Dr. E. J. Butterfield of Dallas Center, spent the month of April in Chicago taking post graduate work at the Chicago Polyclinic.

Dr. W. F. Mueller and wife of Denison, returned from San Antonio, Texas, where they spent the winter for the doctor's health.

A very liberal policy is issued, covering disability due to practically every illness except venereal diseases and epilepsy, for one day to 52 weeks.

Dr. T. B. Throckmorton of Cherokee, read a paper before the Chicago Medical Society, in April, on "Clinical Significance of Reflexes."

Dr. J. W. Harrison of Guthrie Center profitably spent two weeks in April, attending clinics in Duluth, Minneapolis, St. Paul and Rochester.

Mrs. Dr. A. L. Day and son, Donald, are expected to arrive in Mt. Pleasant this week from a six months visit with relatives in Pasadena, California.

Dr. C. E. Quire of Lynnville, was confined to his home in April. We have not heard lately as to the doctor's condition but hope that he is improved.

Dr. F. D. Walk and family of Walker, spent the month of April in Chicago, where the doctor was taking a post graduate course in the Chicago Polyclinic.

Drs. L. V. Porter of Bondurant and G. E. Porter of Menlo are the proprietors of a new general hospital being erected at Colfax, to be known as the "Colfax General Hospital."

The Physicians Casualty Association of Omaha, after successfully conducting a mutual accident association for more than ten years, have decided to enter the health insurance field also.

Dr. F. W. Stewart and family of Colfax, are expecting to leave about May 15th on a cross-country auto trip to Pennsylvania, where they will spend several weeks visiting relatives.

Dr. S. H. Smith of Council Bluffs, met with a severe accident early in April when his automobile struck a derailed street car. He was badly shaken up and a bone in his face was broken.

Dr. G. H. Sumner, secretary of the State Board of Health is interested in national politics in the third district, as his son, A. D. Sumner is candidate for congress on the republican ticket.

Dr. J. T. Haller of Davenport, is home from a several weeks trip in Cuba. The doctor says that Havana is today one of the most sanitary cities of the world and that fever has been practically exterminated.

Dr. H. A. Boyle of Denison, is spending several weeks in Florida, with the idea of locating there permanently. The doctor is a sufferer from asthma and he is in hopes that the southern climate will be beneficial to him.

Dr. W. H. Rendlemen of Davenport, was operated upon for appendicitis, April 28. The doctor was taken ill while at the hospital visiting a patient and upon examination, an immediate operation was found necessary.

The secretary informs us that a simple announcement of their intentions brought applications for charter memberships from more than 700 doctors within two weeks and more than 1,200 policies were issued within sixty days.

Dr. Geo. Wenzlik of Iowa City, of whom mention was made in the last Journal as giving up his practice for farm life in Nebraska, has returned to Iowa. The floods throughout that region ruined his farm prospects, for this year at least.

The Iowa State Board of Health has recently signed a contract which will enable it to furnish anti-toxin to the people of the state at the cost of production. The amount saved in the state, by such a contract is estimated as being between $10,000.00 and $15,000.00 annually.

CHANGE OF LOCATION.

Dr. R. S. Reimers, formerly assistant surgeon at the local Santa Fe employees hospital, is now located at Fort Madison.

Dr. G. A. Starkweather of Pontoosuc, Illinois, has taken up his practice at Fort Madison.

Dr. A. K. Gifford recently of Mechanicsville, is now located in Cedar Rapids.